Appendix E – HEALTH AND SAFETY PLAN (HASP)
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American Marine rules as set forth in the Occupational Safety and Health Act of 1970. Each American Marine employee is required to comply with these safety and health standards as well as all rules, regulations, and procedures.

In the event of injury to any employee, no matter how minor, the employee is required to report it to his/her supervisor at once. There are first aid kits available in the Main Office, in the yard, and aboard the vessels being prepared. Any injury, cut, scratch, or burn requires prompt treatment in order to prevent infection.

The key to the prevention of injuries is the willingness of each employee to work safely and to understand the rules, regulations, and procedures governing their work. Each manager, supervisor, and employee at American Marine must accept his/her responsibility to help in the prevention of accidents. General rules of conduct and safety must be followed in the yard, aboard the vessels, and in the office.

American Marine has taken the following steps in order to maintain a safe and healthy work place for its employees:

- We have developed and we presently maintain a written program that provides systematic policies, procedures and practices that are appropriate to recognize and protect all site personnel from occupational safety and health hazards.
- We have designated an individual responsible for assisting the site manager in implementing the site health and safety programs. This individual is Russ Francis
- American Marine has established safety selection and on site procedures and practices for contractors in order to protect visitors and contractors.
- Regular evaluations of the work environment are conducted to detect and correct unsafe or unhealthy conditions and/or work practices.
- The root causes of incidents, accidents, injuries, and illnesses are determined, and the implementation of corrective actions via changes to equipment, work procedures, and training programs is performed.
- American Marine provides and ensures the use of appropriate clothing and devices to protect against hazards in the work environment. This includes respirators, skin protective clothing, hearing, eye, hand and foot protection, and specialized equipment required for site-specific hazards.
- The work environment and all job tasks at the facility are designed to reduce or eliminate exposure hazards. If hazard reduction or elimination is not feasible, controls are used for the work and for the equipment used to perform the work.
- Plans have been established for responding to potential emergencies in coordination with local emergency response officials, to prevent injuries, to coordinate medical care, and to minimize property damage.
- Employees are provided with the knowledge and skills needed to perform their work safely and in compliance with regulatory requirements.
- Everyone in an organization has some responsibility for health and safety. Health and safety training is an essential element to ensure that all employees understand what hazards they may be exposed to, why the hazards pose a threat, and how they can protect themselves and others from the hazards.

- The Occupational Safety and Health Act of 1970 places clear responsibility for health and safety protection of employees on the employer. Management routinely addresses all work-related hazards, whether or not they are regulated by government standards.
- Supervisors have an especially critical role in health and safety protection because of their immediate responsibility for workers and for the work being performed. Health and safety information and instruction is often incorporated into other training about performance requirements and job practices.
- Health and safety orientation training is required for all contractor personnel operating on American Marine project premises.

American Marine believes that maintaining a safe and healthful work place is a process of continuous improvement. When deficiencies in procedures or worksite hazards are identified, we view these events as opportunities for improvement, and implement corrective action as needed.

This manual is intended to present the guidelines and procedures used by American Marine to maintain a safe and healthful work place. Detailed written Programs of many of the procedures described herein are maintained and regularly updated by American Marine.

Environmental Policy Statement

American Marine is fully committed to protecting the environment in all aspects of its operations. This is a responsibility of both management and employees in all functions of our business. American Marine strives to provide a safe and healthy working environment to avoid adverse impact and injury to the environment and to the surrounding communities. Our programs combine clear leadership by management, the participation of all employees, and the use of appropriate technology in our daily operations.

I certify that under penalty of law that I have personally examined and am familiar with the information submitted in this policy document, and that based on my inquiry of those individuals responsible for obtaining this information, I believe that the submitted information is true, accurate, and complete.

_____
Signature

_____
Printed Name

_____
Title

_____
Date

1. Process Control Procedures for Asbestos

EMPLOYEES

- Do not perform any work in an area that has not been cleared as being asbestos-free.
- Do not enter an area where asbestos removal is taking place unless you are authorized, and proper personal protection is worn.
- Do not enter an area where asbestos removal is taking place unless you have had proper training.
- Know the potential locations of asbestos onboard the vessel.
- If a material that could contain asbestos is identified, do not disturb it and notify your supervisor immediately.
- Place asbestos-containing waste in the proper disposal containers. DO NOT mix asbestos waste with any other type of waste.

EMPLOYER

- Perform a survey to determine the location and quantity of all asbestos-containing materials (ACM) before any other work is performed that may damage or disturb these materials.
- Abate all ACM before performing work that may disturb or dislodge asbestos materials.
- Provide proper personal protective equipment to affected employees. Ensure that these employees have been properly trained on the use of the equipment and that the equipment is properly used at all times.
- Restrict access to all areas where asbestos removal is taking place. Do not allow employees who have not received proper training to enter abatement areas.
- Train all employees who could potentially need to enter abatement areas on the proper procedures to do so.
- Conduct periodic monitoring to determine the exposure levels of asbestos that workers are being subject to. Inform employees of the results of the monitoring as soon as feasible following the receipt of results.
- Provide for the proper waste disposal facilities.
- Maintain records that document the monitoring which has been performed, including date, area, and results of monitoring.

1.1 DEFINITIONS

- "Authorized person" means any person authorized by the employer and required by work duties to be present in regulated areas.
- "Class I asbestos work" means activities involving the removal of thermal system insulation and surfacing ACM and PACM.
- "Class II asbestos work" means activities involving the removal of ACM which is not thermal system insulation or surfacing material. This includes, but is not limited to, the removal of asbestos-containing wallboard, floor tile and sheeting, roofing and siding shingles, gaskets and packing material, and construction mastics.

- "Class III asbestos work" means repair and maintenance operations, where "ACM", including TSI and surfacing ACM and PACM, is likely to be disturbed.
- "Class IV asbestos work" means maintenance and custodial activities during which employees contact but do not disturb ACM or PACM and activities to clean up dust, waste and debris resulting from Class I, II, and III activities.
- "PACM" means presumed asbestos containing material.
- "Permissible Exposure Limit" means 0.1 fibers per cubic centimeter of air (f/cc) reported as an 8 hour time weighted average (TWA) exposure concentration.
- "Regulated Area" means an area established by the employer to demarcate areas where Class I, II, and III asbestos work is conducted, and any adjoining area where debris and waste from such asbestos work accumulate; and a work area within which airborne concentrations of asbestos exceed, or can reasonably be expected to exceed, the permissible exposure limit.
- "Thermal system insulation (TSI)" means ACM applied to pipes, fittings, boilers, breeching, tanks, ducts or other structural components to prevent heat loss or gain.

1.2 REGULATORY AGENCIES

1.2.1 Environmental Protection Agency (EPA)

The US EPA regulates the removal and disposal of asbestos under 40 CFR Part 61--National Emission Standards for Hazardous Air Pollutants - -Subpart M--National Emission Standard for Asbestos, and through 40 CFR 763—Asbestos Model Accreditation Plan.

1.2.2 Occupational Safety and Health Administration (OSHA)

Asbestos removal and disposal as part of a shipbreaking operation is regulated by 29 CFR 1915.1001 *(Asbestos Standard for Shipyard Employment)*

1.2.3 Virginia Department of Professional and Occupational Regulation

Applicable Regulations:

Title 54.1, Chapter 5 – Asbestos Licensing Regulations

1.3 POSSIBLE LOCATIONS OF ASBESTOS

Items aboard a vessel that could potentially contain asbestos include:

- pipe, boiler, and other thermal systems insulation
- gaskets and packing (at pipe flanges and valve assemblies)
- cable insulation
- other insulating, fireproofing, or sound deadening materials

These items will be tested in accordance with the sampling methodology outlined in the next section to determine what amount of asbestos, if any, is contained in these items before their removal.

1.4 METHODS FOR DETERMINING THE PRESENCE OF ASBESTOS

1.4.1 Sample Methodology

The following procedures will be used as guidelines for the identification of Asbestos Containing Materials (ACM) on board ships to be cleaned and prepared for sinking by American Marine.

This procedure is intended to serve as a guide for compliance with applicable federal, state, and local regulations concerning the handling of ACM and the potential of American Marine employees to be exposed to friable ACM. Compliance with this guidance document in no way guarantees compliance with federal, state, and local regulations.

No portion, compartment, or component of any vessel planned for dismantling by American Marine will be removed, cut, salvaged, or otherwise physically disturbed until that portion of the vessel has been inspected for the presence of friable ACM, and that any ACM such identified has been removed from the vessel.

Our plan for the identification will include the following:

Each compartment of the vessel affected by cleaning operations will be systematically inspected for the presence of ACM as needed. The compartment will be inspected visually, with the inspector performing an inventory of observed suspect materials along the way. The materials inventory will include material descriptions, locations, and estimated quantities. If available, a deck plan of the vessel will be used as a guide.

If the inspector determines that a compartment contains suspect ACM, then the material will be sampled and submitted for laboratory analysis.

The inspection of the vessel will proceed in the manner described above until each compartment of the vessel has been visually inspected and samples for suspect materials collected. Upon completion of the inspection, bulk samples of suspect materials will be submitted to an accredited laboratory for analysis.

Once the laboratory results for all sampled materials have been reported to American Marine, American Marine will review the results to determine which materials tested positive for asbestos (greater than 1% asbestos by Polarized Light Microscopy (PLM) analysis). Positive samples will be compared to the materials inventory generated during the inspection, so that a final list of all identified ACM can be developed.

The final list will produce an inventory of ACM aboard the ship, listed by compartment, deck, and/or frame number. The inventory, complete with estimated material quantities and material locations, will serve two purposes.

The inventory will provide American Marine with a list of compartments for which no recycling will be performed until all ACM has been removed from those respective compartments.

The inventory will provide American Marine with a schedule of materials to be removed from the ship, which can be used as a Scope-of-Work for perspective asbestos abatement contractors.

Once identified, all ACM will be conspicuously marked with paint so that they may be easily identified by other American Marine employees, contract employees, and anyone else who boards the vessel.

Some areas of a vessel (e.g., engine rooms, boiler rooms and other compartments with significant amounts of piping) may not be sampled in their entirety since the economic impact of the inspection effort may outweigh the cost for removing all suspect materials. In these cases, all suspect materials in a respective compartment will be assumed to contain ACM, and be removed as such. When this is

the case, no non-certified American Marine personnel will be permitted entry into the compartment until all assumed and/or confirmed ACM has been removed.

1.4.2 Tests/Analysis to be Performed

The following laboratory tests will be performed on all samples collected where applicable:

- Polarized Light Microscopy (PLM) with Dispersion Staining
- Transmission Electron Microscopy (TEM) for Sample Confirmation

1.4.3 Laboratories Performing Analysis

The following analytical laboratory has been identified as one that is qualified to analyze samples for the presence of asbestos:

Universal Laboratories.
20 Research Drive
Hampton, VA 23666
757-865-0880

1.5 ASBESTOS REMOVAL/DISPOSAL

1.5.1 General Conditions

All asbestos removal work will be performed by a contractor regularly engaged in such work. The contractor named below will be performing the removal work for American Marine :

Envirocon, Inc.
3419 Virginia Beach Blvd # C-13
Virginia Beach, VA 23452
757-502-8156

It is the policy of American Marine that its employees, and the employees of other contractors at the site (excluding the asbestos abatement contractor), will not engage in asbestos abatement work. Any American Marine or other contract employee who observes materials in his work area, which he suspects may be ACM, will immediately cease work in that area and contact his supervisor for guidance.

The asbestos abatement contractor will be required to provide evidence of current licensing , as well as proof of experience for projects of similar size and scope.

The asbestos abatement contractor will be required to file the appropriate notifications with the project state office and to the EPA Region III Regional Office.

The asbestos abatement contractor will be required to submit, to American Marine, copies of all valid permits, notifications, licenses, medical records, and training certificates for all personnel who enter the American Marine facility to perform asbestos abatement work.

It is the policy of American Marine that all work involving ACM is performed in strict accordance with all applicable laws, regulations, and standards. Any asbestos abatement contractor found to be in non-compliance with applicable laws, regulations, and standards, or American Marine directives will be discharged from the remainder of his contract.

1.5.2 Worker Protection

The asbestos abatement contractor will provide evidence that a written respiratory protection program has been developed and implemented, is available to employees at the project site, and for inspection by American Marine upon request. The program must comply with the requirements of 29 CFR 1910.134 (Respiratory Protection).

The asbestos abatement contractor will have the responsibility for enforcement of proper respirator use and shall instruct and train all personnel in the same. A copy of respirator fit-test procedures and results shall be maintained at the site for inspection by American Marine personnel, along with verification that all employees have been examined by a physician within the past 12 months and found physically fit to wear respiratory protection.

Respirator selection will be made by the asbestos abatement contractor based on the requirements of 29 CFR 1915.1001 (h) Table 1.

The asbestos abatement contractor will provide all employees involved in asbestos abatement work with disposable protective clothing.

The asbestos abatement contractor shall also provide eye, head, foot, and hearing protection for all employees where such hazards exist.

1.5.3 Protection of the Environment

All work involving the removal of friable and non-friable ACM will be performed in a regulated area. For the purposes of establishing American Marine policy, a regulated area is defined as an airtight enclosure constructed of two layers of 6-mil polyethylene sheeting or other similar material. The regulated area shall be accessed by means of an airlock system, which will also serve as a worker decontamination facility. Ventilation to the regulated area will be provided via a HEPA filtration/exhaust system. The number of HEPA filtration/exhaust units used to ventilate the work area will be dependent on the size of the compartment where the work is being performed, but in no case shall deliver less than 4 air changes per hour.

The worker decontamination facility will consist of a serial arrangement of 3 rooms; the rooms will be designated as the clean room, shower room, and equipment room. No worker will be permitted to enter or exit the regulated area by any route, except through the decontamination unit.

Once the regulated area has been established, no asbestos abatement work will commence until the asbestos contractor's qualified person along with American Marine personnel has inspected the area. Only upon acceptance of the regulated area by American Marine will the authorization be given to proceed.

The asbestos abatement contractor's qualified person will be responsible for inspecting the regulated area at the beginning of each work shift, and at least once per day thereafter. Any defects or damage in the enclosure system will be repaired immediately upon discovery and any resulting debris cleaned up immediately using a HEPA filtered vacuum cleaner.

The asbestos abatement contractor will be responsible for retaining the services of a qualified Industrial Hygiene consultant to monitor all asbestos abatement activities.

1.5.4 Removal Procedures

All asbestos material will be removed using wet methods. Wetting will be performed using water containing a surfactant (amended water).

A fine spray of amended water will be applied prior to removal in order to reduce the fiber release potential of the material. The material should be wetted sufficiently to reduce visible emissions into the air, as well as to maintain airborne fiber levels below the PEL.

The ACM should be removed in small, manageable quantities with no excess accumulation. A "clean and bag as you go" procedure will greatly reduce the clean-up effort at the end of the work day, as well as reduce the potential for employee exposure to asbestos above the PEL.

All removed material will be placed into appropriately labeled 6-mil thick asbestos disposal bags. Care must be taken to ensure that the material is bagged while still wet.

When full, waste bags should be goosenecked, sealed with duct tape, and labeled before removal from the regulated area.

Once all asbestos materials have been removed from a compartment, and no visible residue remains, the waste bags will be wiped down, and double bagged in a second asbestos disposal bag. The double bagged package of waste will then be removed from the regulated area and placed in an enclosed vehicle for transport to an EPA registered landfill for disposal.

1.5.5 Asbestos Materials Disposal

No containers of waste will be left exposed, stored, etc. in any unsecured location either inside or outside/external to the regulated work area and/or the vessel. Properly packaged and labeled asbestos waste awaiting off-site disposal will be stored in a secure, dry location which will protect the containers from damage.

The asbestos abatement contractor shall, at any time, be required to remove existing accumulated properly packaged contaminated material to the approved disposal site off the American Marine work site, but in no case shall accumulated packaged asbestos waste remain on the property for longer than 7 calendar days after project completion.

The asbestos abatement contractor will remove and transport all sealed and labeled bags and drums of asbestos waste to a pre-arranged and approved disposal site off of American Marine property in a manner which prevents airborne emissions of asbestos fibers, and in complete accordance with 40 CFR Part 61, Subpart M.

Within 30 days following the disposal of asbestos waste at the approved landfill facility, the asbestos contractor shall make available to American Marine a copy of the disposal receipt (manifest) or record of appropriate disposal showing the name of the disposal facility and the date of disposal.

1.6 INTERMEDIATE STORAGE

All asbestos-containing waste that is to be stored before being transported from the site will be double-bagged with a caution label attached. These bags will be disposed of in an on-site enclosed dumpster which will be designated as being exclusively for asbestos-containing materials.

1.7 LABELING/MARKING

1.7.1 Warning signs

Warning signs shall be provided and displayed at each regulated area. In addition, warning signs shall be posted at all approaches to regulated areas so that an employee may read the signs and take necessary protective steps before entering the area. The warning signs shall bear the following information:

DANGER
ASBESTOS
CANCER AND LUNG DISEASE HAZARD
AUTHORIZED PERSONNEL ONLY
RESPIRATORS AND PROTECTIVE CLOTHING ARE REQUIRED IN THIS AREA
[if required]

American Marine shall ensure that employees working in and contiguous to regulated areas comprehend the warning signs required to be posted. Means to ensure employee comprehension may include the use of foreign languages, pictographs, graphics, and awareness training. At the entrance to mechanical rooms/areas in which employees reasonably can be expected to enter and which contain ACM and/or PACM, signs which identify the material which is present, its location, and appropriate work practices which, if followed, will ensure that ACM and/or PACM will not be disturbed shall be posted.

1.7.2 Warning labels

Warning labels shall be affixed to all raw materials, mixtures, scrap, waste, debris, and other products containing asbestos fibers, or to their containers. When previously installed ACM and/or PACM is identified, labels or signs shall be affixed or posted so that employees will be notified of what materials contain ACM and/or PACM. Labels shall be attached in areas where they will clearly be noticed by employees who are likely to be exposed, such as at the entrance to mechanical rooms/areas. Labels shall be printed in large bold letters on a contrasting background. Signs required by 29 CFR 1910.1001 (j) (3) may be posted in lieu of labels so long as they contain information required for labeling. The labels shall comply with the requirements of 29 CFR 1910.1200(f) of OSHA's Hazard Communication standard, and shall include the following information:

DANGER
CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER AND LUNG DISEASE HAZARD

The provisions for labels do not apply where:

- Asbestos fibers have been modified by a bonding agent, coating, binder, or other material provided that the manufacturer can demonstrate that during any reasonably foreseeable use, handling, storage, disposal, processing, or transportation, no airborne concentrations of fibers of asbestos in excess of the action level and/or excursion limit will be released, or
- Asbestos is present in a product in concentrations less than 1%.

2. Process Control Procedures for Lead

EMPLOYEES

- Know the potential locations of lead onboard the vessel.
- Understand and follow the requirements of the Lead Hazard Control Plan.
- Do not enter an area where lead abatement is occurring unless you have been trained and licensed in the proper procedures for lead removal.
- Wear proper protective clothing and equipment where lead abatement is taking place.
- Place lead-containing waste in the proper disposal containers. DO NOT mix lead waste with any other type of waste.

EMPLOYER

- Ensure that all employees involved in paint removal or paint stabilization work have been trained and licensed in accordance with OSHA and State requirements.
- Understand and implement the provisions of the Lead Hazard Control Plan.
- Provide proper personal protective equipment to the appropriate personnel. Ensure that these employees have been trained on the proper use of the equipment and that the equipment is properly used and cared for.
- Perform medical monitoring for all employees as stipulated by OSHA. Maintain the medical records for each employee for 40 years or for the duration of employment plus 20 years, whichever is longer.
- Ensure that waste is disposed of in proper containers. Do not mix lead-contaminated waste with any other type of waste.
- Notify employees of the results of any medical screening and monitoring results within 5 working days.

2.1 REGULATORY AGENCIES

2.1.1 Environmental Protection Agency (EPA)

The EPA regulates the removal and disposal of lead under EPA Guidelines for the Land Disposal of Solid Wastes found at 40 CFR 241.

2.1.2 Occupational Safety and Health Administration (OSHA)

OSHA regulates the removal and disposal of lead under 29 CFR 1910.1025, “Toxic and Hazardous Substances - Lead” and 29 CFR 1915.1025, “Toxic and Hazardous Substances - Lead.”

2.1.3 Commonwealth of Virginia

- Virginia Lead-Based Paint Activities Regulations; Title 54.1, Chapter 5.
- Virginia Waste Regulations:
  - Chapter 60 – Hazardous Waste
  - Chapter 80 – Solid Waste
  - Chapter 110 – Transportation of Hazardous Materials.

2.2 POSSIBLE LOCATIONS OF LEAD

Lead as used in this program means metallic lead, all inorganic lead compounds, and organic lead soaps. All other organic lead compounds are excluded. Lead's abundance, low melting point, high molecular weight, high density, and malleability make it a useful structural material. When added to resin, grease, or rubber, lead compounds act as antioxidants. Items that commonly contain lead on vessels may include:

(1) Primer Paints
(2) Paint filler and hardener
(3) Rubber antioxidant
(4) Painted wood products
(5) Solder for electrical components and pipe joints
(6) Painted metal products
(7) Roof flashing.

While not an absolute indicator, red, forest green, chrome yellow, "school bus yellow," and "OSHA yellow" paints typically contain lead components, such as lead oxides and lead chromate. Lead is also found in polyurethane and water base paints.

These items will be tested in accordance with the sampling methodology outlined in the next section to determine what amount of lead, if any, are contained in these items before their removal.

Exposure to lead may occur during one of the following operations:

- Material handling (lead painted)
- Spraying, sanding, grinding, burning, welding, cutting, and abrasive blasting of lead containing materials and paint
- Soldering with torches
- Abrasive blasting with smelting slag
- Contaminated personnel clothing, etc.

2.3 METHODS FOR DETERMINING THE PRESENCE OF LEAD

2.3.1 Sample Methodology

Items identified above that require either paint stabilization or paint removal will be analyzed to determine the presence of lead.

2.3.2 Tests/Analysis to be Performed

The primary means by which painted surfaces will be evaluated for the presence of lead will be X-Ray Fluorescence (XRF). Only those individuals who have been trained and certified in the use of such equipment will be permitted to perform evaluations for lead-based paint/coatings.

The following laboratory tests may and/or will be performed for paints or coatings that did not provide conclusive results by XRF:

NIOSH 7300, 7082, and 7105, where applicable.

Only those individuals who have been trained and licensed in accordance with State Lead-Based Paint regulations will perform evaluations of painted surfaces.

2.3.3 Laboratories Performing Analysis
The following analytical laboratory has been identified as one that is qualified to analyze samples for the presence of lead:

Universal Laboratories
20 Research Drive
Hampton, VA 23666
Phone: 757-868-0880 Fax: 757-865-8014

Universal Laboratories is fully accredited and licensed to perform analysis for lead.

2.4 LEAD REMOVAL/DISPOSAL

2.4.1 Removal
The following contractor will be performing paint stabilization and/or removal:

Envirocon, Inc.
3419 Virginia Beach Blvd # C-13
Virginia Beach, VA 23452
Phone: (757) 502-8156 Fax: 757-502-8158

All AMG employees and contractors will follow the lead exposure guidelines and procedures outlined below.

4.4.1.1 PEL
The PEL for an 8-hour time weighted average (TWA) exposure to airborne lead is 50 micrograms per cubic meter ($\mu g/m^3$) of air. If an employee is exposed for more than 8 hours in a workday, the PEL will be determined by the following formula.

$$PEL\ (\mu g/m^3) = 400/\text{No. Hours Worked per Day}$$

When an employee's exposure exceeds the PEL for more than 30 days per year, engineering and administrative controls will be implemented to the extent feasible to reduce the exposure to below the PEL. Where such controls are not feasible, they, nevertheless, will be used to lower exposure to the maximum extent possible and will be supplemented with respiratory protection. Where an employee is exposed to lead above the PEL for 30 days or less per year, engineering controls will be used to reduce exposures at least to 200 $\mu g/m^3$, but thereafter, any combination of engineering, work practice, and respiratory controls may be used to reduce employee exposure to or below 50 $\mu g/m^3$.

2.4.1.2 Action Level (AL)
The AL for an 8-hour TWA exposure to airborne lead is 30 $\mu g/m^3$ (without regard to respirator use). Exposure to airborne lead at or above the AL will trigger the following requirements:

Biological monitoring and medical surveillance will be initiated when an employee's exposure exceeds the AL for more than 30 days per year.

2.4.1.3 Controls

The basic principles for controlling hazards in the occupational environment include substitution with less hazardous materials, engineering controls (ventilation), administrative controls job rotation, work time limits), and use of personal protective equipment (PPE); in that order.

2.4.1.4 General Workplace Control Practices

(1) A Lead Hazard Control Plan will be developed and implemented for use at the project site.
(2) Hot operations (torch and welding operations on lead containing materials), abrasive operations, and handling of bulk lead coated materials are of primary concern because they can generate large amounts of respirable lead.
(3) Work surfaces will be maintained as free of lead dust as is practical. Such dust will be cleaned up with high efficiency particulate air (HEPA) filtered vacuum cleaners. Wet sweeping may not be used under any circumstances.
(4) Lead containing waste, scrap, debris, containers, equipment, and clothing consigned for disposal, which may generate airborne lead concentrations in excess of the PEL or produce water pollution, will be collected, sealed, and labeled in impermeable containers per Environmental Protection Agency (EPA) requirements, and state and local regulations.
(5) To minimize exposure potential, hot work on lead and abrasive lead removal operations will, to the extent feasible, be isolated from other operations.

2.4.1.5 Ventilation

Local exhaust ventilation is frequently required to ensure that atmospheric levels of lead particulate do not exceed the PEL. General requirements for the design and use of ventilation to reduce exposures are listed below. Specific guidance for each lead operation will be obtained from the AMG Safety Officer.

To the maximum extent possible, a local exhaust system will be provided at the point of airborne particulate generation. Capture velocities will be high enough to entrain generated particulates under the specific environmental conditions. Duct transport velocities will be high enough to prevent accumulation of particulates in the duct, and clean-out points will be provided for periodic maintenance. The recommendation or approval of specific equipment design parameters, as well as protective clothing, respiratory protection, and system servicing procedures for each operation will be provided by the AMG Safety Officer.

Local exhaust ventilation and dust collection systems will be designed, constructed, installed, and maintained per 29 CFR 1910.94; “Industrial Ventilation: A Manual of Recommended Practice,” published by ACGIH; and ANSI Z9.21979.

Ventilation systems, used to control lead exposures or emissions, will be tested by the site safety officer personnel at least every 3 months and within 5 days of any production, process, or control change which may result in a change in employee exposure. Test records will be retained for 30 years. Where devices such as manometers, pitot tubes, etc. are installed to continuously monitor the effectiveness of ventilation systems, employees who use the system will be instructed on the meaning and importance of the measurements and to immediately contact their safety office if the measuring devices indicate a malfunction. Where such devices are in place, safety personnel need inspect the ventilation systems only annually.

Ventilation systems used to control occupational exposures of emissions will not be directly exhausted into any work space or to the atmosphere. Recirculation of air from operations generating lead is not permitted
Exhaust filtration systems must be maintained to prevent performance degradation of the ventilation system as a whole.

2.4.1.6 Personal Protective Clothing and Related Control Facilities

Personnel engaged in the handling of lead, or in situations where the concentration of airborne lead particulates is likely to exceed the PEL of where the possibility of skin or eye irritation exists, will remove clothing worn to and from work and wear the protective clothing provided by AMG . Clothing will be waterproof when wet lead is handled. Protective clothing includes:

- Full *body, one-piece coveralls supplied* and laundered by AMG or a contractor will be used. One-piece disposable coveralls made of TYVEK™ material (or equivalent) may also be used.
- Durable gloves and head covering will be used. Hoods (head covering) will extend beyond the collar of the coverall, completely protecting the neck area.
- Slip resistant shoe covers or lightweight rubber boots will be provided. Disposable shoe covers may also be used.
- Face shields, vented goggles, or other appropriate protective equipment will be provided and used whenever the possibility of eye irritation exists.
- The proper use of protective clothing requires that all openings be closed and that garments fit snugly about the neck, wrists, and ankles. Accordingly, the wrist and ankle junctions, as well as the collar opening on coveralls will be taped, as necessary, to prevent contamination of skin and underclothing without restricting physical movement. Clean protective clothing will be provided at least weekly and will be provided daily when the 8-hour TWA airborne concentration exceeds 200 $\mu g/m^3$.

Change rooms are provided as close as practical to the lead work area(s) for employees who work where the airborne lead exposure is above the PEL (without regard to the use of respirators). Change rooms are maintained under positive pressure with respect to adjacent lead work areas. Protective clothing removal procedures will be posted in the change room and include vacuuming of clothing (before removal and while still wearing a respirator, if one was required for the task) using a HEPA filter vacuum. Removal of lead particles from cloth by blowing or shaking is prohibited.

Employees exposed to airborne lead concentrations above the PEL (without regard to respirator use) will shower at the end of the work shift when showers are provided. Shower facilities will be located between the clean and dirty change rooms for employees to shower at the end of their work shift. Change rooms areas will be provided and will have two separate clothing lockers to prevent contamination of street clothes and to ensure that employees do not leave wearing any clothing or equipment worn during their work shift. Supervisors will ensure that employees at a minimum wash their face and hands at the end of their work shift.

Laundering of lead contaminated clothing will be done to prevent release of lead dust in excess of the AL. Contracts governing laundering of lead contaminated clothing will specifically require that contractors comply with the precautions specified in this program. Lead contaminated clothing will be transported in sealed containers to which are affixed the standard "caution label". Persons who clean or launder protective clothing or equipment will be notified in writing of the potentially harmful effects of exposure to lead.

2.4.1.7 Respiratory Protection

Limits of Respirator Usage

Engineering control measures will be used per paragraph 1-3. Compliance with PELs will not be achieved solely by the use of respirators except under the following conditions:

- During the time period necessary to implement engineering control measures;
- In work situations in which the control methods prescribed are not technically feasible or are not sufficient to reduce the airborne concentration of lead particulates below the PEL.
- During emergencies.

A respirator program will be established as described in 29 CFR 1910.134. Where a respirator is required, it will be National Institute for Occupational Safety and Health and Mine Safety and Health Administration approved. Qualitative fit tests will be required for all respirator users at the time of initial fitting and at least every six (6) months thereafter for all users of negative pressure respirators. Fit tests will be conducted under the guidelines provided in reference Breathing air or sources of breathing air for supplied air respirators or self-contained breathing apparatuses (SCBAS) will comply with the requirements in 29 CFR 1910.134. An employee will not be assigned to tasks requiring the use of a respirator if, base upon the employee's most recent medical examination, documentation reveals that the employee will be unable to function normally wearing a respirator or that the safety or health of the employee will be impaired by his/her use of a respirator. A powered air-purifying respirator with HEPA filter will be provided in lieu of a half full-face piece respirator if the employee chooses to use this respirator and it provides adequate protection. A respirator will be provided to employees who work with lead, upon request. Such employees will be entered into the respiratory protection program.

Respirator Selection

Respirator selection will be per Table l of 29 CFR 1910.1025.

2.4.1.8 Housekeeping

Where lead-containing materials are routinely accumulated, all surfaces will be maintained as free as practical of lead accumulation. Surfaces will be cleaned at least once per shift to prevent accumulation of lead dust or more frequently, if necessary. All cleaning will use methods, such as vacuuming with HEPA filtered vacuum cleaners or washing down, where feasible, observing water pollution regulations as they pertain to lead contaminated wastewater. Wet sweeping, shoveling, or brushing will be used when other methods have been tried and found to be ineffective or unfeasible. Compressed air will NOT be used to clean work surfaces or floors.

2.4.1.9 Lunch Areas and Personal Hygiene

Separate lunch areas will be established for employees who work in areas where their airborne lead exposure is above the PEL (without regard to the use of respirators). Protective clothing and equipment will be removed before entering lunchroom facilities. Eating, drinking, chewing or smoking of tobacco products, the application of makeup, and storage of food and tobacco products will be prohibited in lead work areas. Clothing worn during lead work will not be cleaned by blowing down with compressed air or by shaking. Lead workers will wash their hands and face prior to eating, drinking, smoking, or applying cosmetics.

2.4.1.10 Training

All personnel who work in areas where the potential exists for lead exposure will receive initial training prior to or at time of assignment and at least annually thereafter. The training will include, as a minimum, the following:

- The specific nature of the operations during which exposure is possible
- The purpose, proper selection, fit testing, use, and limitations of respirators
- The adverse health effects of lead with particular attention to the reproductive effects upon both males and females
- The purpose and description of the medical surveillance program, including the use of chelating agents and medical removal protection benefits.
- The engineering controls and work practices to be applied and used in the employee's job, including PPE and personal hygiene measures
- The contents of the compliance program.

2.4.1.11 Industrial Hygiene Surveillance

Each jobsite will be evaluated at the beginning of each project, or more frequently, if necessary, where lead is used and will reevaluate the operation within 5 working days of any work process or control change. Where a potential for exposure from inhalation of airborne lead particulate or personnel contamination is found, a workplace monitoring plan will be established to characterize exposures for every employee occupationally exposed. In this regard, both personal (employee) air sampling and environmental (area) monitoring are necessary and will be conducted for at least 7 continuous hours. Personal air samples will be collected in the breathing zone of the employee per this section. Area monitoring will include air sampling adjacent to the operation.

2.4.1.12 Positive Initial Evaluation

When the initial worksite evaluation indicates that personnel may be exposed at or above the AL, the procedures below will be initiated.

- Operations having airborne lead concentrations exceeding the AL but not the PEL will be monitored as follows:
  - Operations which occur at least once every 6 months will be monitored at intervals of 6 months or less until two consecutive sample sets, collected at least 7 days apart, indicate that other sampling frequencies found in this section are appropriate.
  - Operations which occur at intervals greater than 6 months will be monitored whenever they occur until two sample sets, collected at least 7 days apart, indicate that other sampling frequencies found in this section are appropriate.
- Operations having lead concentrations exceeding the PEL will be monitored as follows:
  - Operations which occur at least once every 3 months will be monitored at three-month intervals or shorter until two consecutive sample sets, collected at least 7 days apart, indicate that other sampling frequencies found in this section are more appropriate.
  - Operations which occur at intervals greater than 3 months will be monitored whenever they occur until two consecutive sample sets, collected at least 7 days apart, indicate that other sampling frequencies found in this section are more appropriate.

If, subsequent to a positive initial determination, the institution of controls reduces employee exposures to below the AL, as evidenced by two consecutive sample sets collected at least 7 days apart, then monitoring may be discontinued.

2.4.1.13 Negative Initial Determination

When the initial worksite evaluation indicates that personnel have not been exposed at or above the AL, the monitoring need not be repeated.

2.4.1.14 Records

All environmental and personal air sampling records will be retained for the period of employment plus 20 years, whichever is greater. Each individual currently or previously employed by AMG , or any other person he/she may designate, will have access to all such records within 15 days of the request. Refer to 29 CFR 1910.1025 for additional guidance.

2.4.1.15 Employee Notification

Within 5 working days after the receipt of monitoring results, AMG will notify each employee in writing of the results that represent that employee's exposure. Whenever the results indicate that the employee was exposed above the PEL, without regard to respirator use, the written statement will include that fact and a description of the corrective action(s) taken to reduce the individual's exposure.

2.4.1.16 Medical Surveillance Program

General

This program consists of three basic elements:

(1) Preplacement medical evaluation
(2) Semi-annual blood lead monitoring
(3) Follow-up medical evaluations and blood lead analysis based on the results of blood lead analysis and physician opinion.

Personnel will be included in this program when industrial hygiene surveillance indicates that they perform work or are likely to be in the vicinity of an operation which generates airborne lead concentrations at or above the AL 30 days per year. Examinations may include special purpose histories and physical examinations, and laboratory tests designed to detect early signs of lead overabsorption. Inclusion in this program is based on measured airborne concentrations without regard to respirator use and, therefore, does not indicate that an individual is overexposed to lead.

Program Elements

1. **Preplacement Evaluation**. All personnel will receive a preplacement evaluation prior to assignment to a position involving potential exposures to lead that equal or exceed the AL. This evaluation will include, as a minimum, the following:

    - A comprehensive occupational and medical history, detailing prior exposure to potentially harmful chemical or physical agents, particularly lead. Any adverse effects related to these exposures will also be recorded.
    - A physical examination with particular attention to neurological, gastrointestinal, and cardiovascular systems.
    - Blood analysis to include:

- Blood lead analysis.
- Complete blood count (CBC) with differential hemoglobin and hematocrit determinations, red cell indices, and examination of peripheral blood smear to evaluate blood morphology.
- Blood urea nitrogen (BUN).
- Serum creatinine.
- Zinc protoporphyrin.

- Routine urine analysis with microscopic examination.
- Respiratory Fitness for Duty. A judgment of the individual's ability to perform a required job while wearing respiratory protection equipment. This requirement only applies to those individuals whose current work will expose them to lead at or above the AL. The finds of severe respiratory impairment from any cause, e.g., forced expiratory volume in 2 seconds/forced vital capacity (FEVi/FVC) less than 45 percent, FVC less than 70 percent of predicted, or evidence of lead intoxication will be considered disqualifying for initial assignment. Any other abnormalities discovered in the course of the preplacement evaluation should be investigated to determine if they could substantially increase the risk from lead intoxication.

2. **Blood Lead Levels and Frequency of Monitoring**. Blood lead analysis and ZPP will be performed every six months for all personnel who are or may be exposed to lead above the AL for more than 30 days per year. Analysis will be performed every 2 months when the blood lead level exceeds 30 μg/l00g of whole blood.

Follow-up Medical Surveillance

a. **Medical Removal**. If an employee's blood lead concentration equals or exceeds 60 μg/l00 g, or the average of his/her last three blood lead measurements equals or exceeds 50 μg/100 g, or the employee has signs or symptoms of lead toxicity, the employee will be reassigned to other non-lead work. For additional guidance concerning removal procedures, return to job status, and removal protection requirements, refer to reference L-4. Pregnant women exposed to lead at or above 50 $\mu g/m^3$ or with a blood lead level of 30 μg/mg blood will be reassigned to a job without lead exposure, with medical removal benefits.

b. **Follow-up Blood Lead Monitoring**. Follow-up lead monitoring will be performed within 2 weeks of the receipt of an initial or routine monitoring result with a blood lead concentration at or above 30 μg/mg of whole blood, and periodically thereafter according to the following criteria.

1. During medical removal (to non-lead work activity), the employee's blood lead concentration will be monitored monthly until the employee's last two consecutive tests are at or below 40 μg/100 g, at which time the employee may be returned to his/her regular work activity.

2. When an employee's blood lead concentration is between 30 and 40 μg/100 g, it will be monitored every 2 months until the last two consecutive blood tests are less than 30 μg/100 g.

c. **Follow-up Evaluations**

1. **Medical Follow-up**. A medical evaluation identical to the preplacement evaluation, with the exception of chest x-rays, will be conducted annually for each person found to have a blood lead concentration at or above 30μg/mg at any time during the prior year.
2. **Reassignment/Termination or Employment Follow-up**. A medical evaluation identical to the preplacement evaluation will be conducted just prior to the reassignment or termination of an employee from a job requiring medical surveillance.

3. **Physicians Written Opinion**. A written opinion is required.

4. **Industrial Hygiene Follow-up Investigation.** The safety officer will be notified of, and perform an investigation to determine the cause of each blood lead concentration at or above 30 μg/100 g which has been verified by follow-up blood lead monitoring.

d. **Other Appropriate Medical Evaluations**. A medical examination, including those elements of the preplacement examination which the physician deems necessary, will be performed:

- As soon as possible after notification by an employee that he/she has developed signs or symptoms commonly associated with lead intoxication.
- As soon as possible after notification that the employee desires medical advice concerning the effects of current or past lead exposure on the ability to procreate a healthy child.
- As soon as possible after being informed that the employee has demonstrated difficulty breathing during a respirator fit test or during respirator use.
- As medically appropriate for personnel who have been removed from exposure to lead due to risk of sustaining material impairment to health, or otherwise limited pending a final medical evaluation.

e. **Administrative Procedures**

1. **Employee Notification**. The employee will be notified of the following, in writing, within 5 working days after receipt of results, when his/her blood lead level is at or above 30 μg/100 g whole blood:

(a) His/her blood lead concentration level, as reported; and
(b) That the regulations require temporary medical removal with Medical Remove Protection benefits when, and if, the employee's blood level exceeds the current numerical criterion for medical removal under 29 CFR 1910.1025.

2. **Employee Counseling**. Personnel will be counseled regarding any abnormalities detected during any screening test. The physician will make an entry into the employee's medical record that describes the counseling given-. The employee will countersign this entry.

f. **Medical Records**

1. Each employee record will include the following identifying information:
   - Name;
   - Social security number;
   - Date of birth; and
   - Dates of examinations.

2. All records of examinations, possible lead related conditions, related laboratory results, and all forms and correspondence related to the employee's medical history will become a permanent part of the health record and be retained for the period of employment plus 20 years.

3. The judgment of the occupational health physician concerning the adequacy of the diagnostic information to support the impression of lead related disease will be entered in the medical record. Lacking definitive information, the evaluating physician must exercise his/her best medical judgment on each medical case.

4. Copies of any examinations, laboratory results, or special studies in an employee's health record or compensation folder will be made available to them after execution of a proper release of information form.

5. The employee may designate a second physician to review any findings and conduct independent examinations and tests as may be deemed necessary. AMG will provide the initial and consulting physician the following:
   - Description of employee's duties
   - Employee's exposure level
   - Description of PPE
   - Blood lead determinations
   - All prior written medical opinions.

6. Each individual currently or previously employed by AMG or any other person he/she might designate will have access to the records within 15 days of the request.

2.4.1.17 Work Performed by Private Contractors.

Contract administrators will ensure that each contract, for work performed by private contractor that may involve worker lead exposures, will incorporate appropriate references and clauses to ensure that:

a. The contractor is made aware of the potential hazard to his/her employees and other personnel.
b. The contractor will comply with 29 CFR 1910.94, 29 CFR 1910.1025, and 29 CFR 134 to protect his/her employees as well as other personnel.

c. The contractor will measure and control lead dust outside of the work boundary to less than 30 μg/m3 at all times. In addition, the controlled work area(s) will meet these criteria prior to release for unrestricted access. Copies of the contractor's monitoring results will be provided to the cognizant industrial hygienist.

2.4.1.18 Responsibilities

The following responsibilities are assigned to provide an effective lead exposure control program throughout the company.

a. The Environmental Safety Manager will:
- Centrally manage the Lead Compliance Program; and
- Provide professional safety officer with technical support and training assistance for the purpose of evaluating the potential for lead exposure.

b. Field Supervisors
- Control measures and monitoring procedures prescribed in this program are allied to processes using lead or lead containing materials.

2.4.2 Disposal

Care must be taken to ensure that measures taken to meet local and national emission standards are compatible with requirements contained in this program, particularly with regard to collection devices and disposal procedures involved in removal of lead coating and hot work on lead coated surfaces. Lead containing materials classified as hazardous waste (HW) will be handled per 40 CFR 241, "Guidelines for the Land Disposal of Solid Wastes." The disposal of hazardous lead waste required bagging in heavy duty plastic bags or other impermeable containers which must be provided with caution labels described in paragraph 1-3.e. Lead waste containers such as bags, trash cans, dumpsters, etc., will be labeled "LEAD WASTE ONLY". Care will be exercised to prevent bags and other containers from rupturing when being moved to a dumpster or other suitable vehicle for transport to a HW disposal site.

Lead materials, properly contained and disposed of in an approved HW landfill, should not pose a hazard to human health or the environment. Specific locations within landfills used for the disposal of lead materials will be recorded by the landfill operators with a permanent record retained by AMG . This practice should reduce the possibility of future unearthing and rupturing of disposal containers.

2.5 LABELING/MARKING

Warning signs will be provided and displayed at each location where airborne lead concentrations may exceed the PEL. Signs will be posted conspicuously posted so personnel may read the signs and take necessary precautions before entering the area. Signs will be illuminated, as necessary, and free of statements that detract from their intent. Signs, in compliance with 29 CFR 1915.1025, may contain a listing of required protective equipment and will state, as a minimum, the following:

WARNING
LEAD WORK AREA
POISON
NO SMOKING, EATING, OR DRINKING

Caution labels will be affixed to containers of contaminated clothing, equipment, raw materials, waste, debris, or other products containing lead if, in any foreseeable way, levels of airborne lead could be produced which might constitute a threat to health. These caution labels will state:

CAUTION
CLOTHING CONTAMINATED WITH LEAD
DO NOT REMOVE DUST BY BLOWING OR SHAKING
DISPOSE OF LEAD CONTAMINATED WASH WATER IN ACCORDANCE WITH APPLICABLE LOCAL, STATE, OR FEDERAL REGULATIONS

3. Process Control Procedures for Polychlorinated Biphenyls (PCBs)

Control procedures for PCB's involve considerations for both human health and the environment. For this reason, American Marine's PCB control program contains elements that are essential to both worker and environmental protection. All PCB remediation on the Kittiwake will be conducted under the supervision of Dominion Marine Group and its parent company American Marine Group. Remediation of all PCBs will be performed by Envirocon Inc.

Employee Responsibilities

- Know the potential locations of PCB-containing materials onboard the vessel.
- Do not perform any shipbreaking operations before a survey for PCB-containing items has been conducted.
- If a material that could contain PCBs is located, notify your supervisor immediately.
- Where PCB-contaminated materials are being removed, wear all appropriate personal protective equipment according to training that you have received.
- Properly label all containers used to contain PCB-contaminated wastes.
- Do not allow any PCB-containing waste or suspect PCB-containing materials to be released to the environment.
- Properly store all PCB-containing materials.
- Immediately report the release to the environment of any PCB-containing or suspect PCB-containing materials.
- Place PCB-contaminated waste in the proper disposal containers. DO NOT mix PCB waste with any other type of waste.

Employer Responsibilities

- Train employees on the correct procedures for removing and disposing of PCBs.
- Perform a survey for PCB-containing materials before any shipbreaking work is performed. Perform this survey after surveys for asbestos has been performed.
- Ensure that employees have been supplied with the proper personal protective equipment, that they have been trained on its proper use, and that the equipment is properly used at all times.
- Maintain all required records concerning PCB-containing waste. These records should include (for each container disposed of): container contents, PCB concentrations (ppm), the container's total volume, unique identification number, date place in transport for disposal, and the date disposed of, if known. Use these records to prepare a required "Annual Records Report".
- Maintain all records for five years after operations have ceased at American Marine.
- Certify that regulated PCB-containing materials have been removed as per the Cayman Islands Application to MARAD for the Kittiwake and in accordance with 40 CFR 761 (in particular 40 CFR 761.62) and EPA's Best Management Practices for Preparing Vessels Intended to Create Artificial Reefs ("BMPs")

3.1 Regulatory Agencies

3.1.1 Environmental Protection Agency (EPA)

The EPA regulates the removal and disposal of PCBs under the Toxic Substances Control Act (TSCA) Section 6(e) and 40 CFR 761. The following activities are covered:

- Labeling
- Removal of PCB Contaminated Items
- Storage of PCB Items for Disposal
- Disposal of PCB Items
- Records and Reports

American Marine does not plan to store PCBs at the site for longer than 30 days. However, in the event that PCBs may be stored at the site, proper notification will be given to the U.S. Environmental Protection Agency.

3.1.2 Commonwealth of Virginia

The Commonwealth of Virginia regulates the removal and disposal of PCBs under Title 9 Virginia Administrative Code (Solid Waste Management Regulations) Chapter. In addition to any federal requirements, PCB waste generators are required to assign an eight-character waste code to each container that is discarded.

3.2 Possible Locations of PCBs

Items aboard a vessel that could potentially contain PCBs include: (and as identified in the BMPs)

- electrical equipment--including transformers, capacitors, fluorescent light ballasts, voltage regulators, circuit breakers, liquid filled cable, reclosers, rectifiers
- hydraulic equipment: heat transfer fluids, vacuum pump oil, air compressor lubricants
- cutting oil
- grease
- non-conducting materials in electrical cables (such as plastics and rubber)
- gaskets in air handling systems
- other rubber gaskets
- other felt gaskets
- grouting/caulking
- adhesives
- tapes
- rubber isolation mounts
- thermal insulation material (including fiberglass, felt, foam, and cork)
- oil-based paints
- mastics
- pipe hangers
- foundation mounts
- sound deadening felt
- rubber/plastic parts of all sizes and shapes
- any other materials where plasticizers were used

These items will be removed in accordance with the methodology outlined in the next section before their removal from the vessel.

3.3 Methods for Determining the Presence of PCBs

All vessels will be surveyed visually upon arrival to determine the location of items that could potentially contain PCBs. The EPA's BMPs will be used as the basis for each PCB identification survey. Solid media that may contain PCBs include thermal insulation such as fiberglass, felt, foam, and cork; gaskets, oils, transformers, capacitors, electrical cable, circuit breakers, voltage regulators, fluorescent light ballast and applied paints. Liquid media that may contain PCB concentrations in excess of 50ppm include lubricants, hydraulic oils, and transformer and capacitor oils. The following standard procedures and norms will be used in the identification and sampling of PCBs in a vessel:

1. All electrical cable will be presumed to contain greater than 50 ppm of PCBs and as such will be removed and disposed of as described later in this section.

2. All ventilation gaskets will be presumed to contain greater than 50 ppm of PCBs and as such will be removed and disposed of as described later in this section.

3. All water line and fuel line gaskets will be presumed to contain greater than 50 ppm of PCBs and as such will be removed and disposed of as described later in this section.

4. All other media, as identified in the BMPs such as fiberglass insulation, cork insulation, caulking, grout, and fluorescent light ballast casings will also be presumed to contain greater than 50 ppm and will be removed and disposed of as described later in this section.

5. All transformers, capacitors, circuit breakers and voltage regulators will be presumed to contain greater than 50 ppm of PCBs and as such will be removed as described later in this section.

6. Any and all tanks containing heat transfer fluids, oils, lubricants, and/or greases will be emptied and cleaned.

7. Environment Profiles will inspect the Kittiwake following remediation and sample as needed as defined in their plan in the Cayman Islands Application to MARAD for the Kittiwake.

   The rational behind the norms listed above is the high probability that these materials contain significant PCB concentrations. Assuming all items listed above contain greater than 50 ppm of PCBs will significantly reduce the sampling costs associated with the process and will also minimize the inherent omission risk of random sampling.

All samples will be identified, labeled and traced by the deck and compartment from which they were extracted. Furthermore, they will be plotted in a diagram of the vessel for ease of reference.

Qualified field personnel under supervision from American Marine will perform all sampling. A chain of custody form will be maintained for all samples collected.

Testing and Analysis to be Performed

The following laboratory analysis will be performed for all samples collected: EPA extraction method 3540C and analytical Method 8082 will be used on all further testing and analysis.

Laboratories Performing Analysis

The following analytical lab has been identified as one that is qualified to analyze samples for the presence of PCBs:

Universal Laboratories
20 Research Drive
Hampton, Virginia 23666

Universal Laboratories maintains numerous accreditations and laboratory certifications.

3.4 PCB Removal, Storage, and Disposal

Removal

All gaskets, electrical cable, transformers, capacitors, circuit breakers, and all other potential media that are identified in the BMPs as possible PCB containments will be removed by trained and licensed personnel, namely Envirocon Inc.

Envirocon will remove PCB items from the vessel according the cutting and dismantling schedule developed for that particular vessel. All PCB materials will be removed using non-flammable means such as clippers, cutters, electric saws and/or manual saws. Workers will utilize appropriate PPE during the removal process, including but not limited to goggles, halfmask respirators with HEPA filtration cartridges, hardhats, rawhide gloves, and cotton uniforms that will be laundered daily by American Marine.

These items will be placed in a structurally sound metal bin, which will be labeled as containing PCBs. Fiberglass insulation will be placed into high-density, 6-mil polyethylene disposal bags prior to being deposited in the bin. A label will be placed on the bin, indicating the date on which the first items were placed into that respective bin.

Any items placed inside the bin henceforth will be considered to have been generated on the original date placed on the bin until the bin is full and ready for disposal. A dated log will be kept of the descriptions and approximate quantities of PCB Bulk Product Waste placed in the bin in order to identify the make-up and dates of removal of all items inside the bin.

American Marine intends not to maintain any PCB Bulk Product Waste on its premises for more than 30 days. The bin in which this waste will be stored during such time period will be covered to prevent rainfall contamination and/or exposure to the weather.

Any items or areas of the vessel containing materials contaminated with liquid PCB's will be identified and removed from the vessel first. These items require more careful handling than solid PCBs since they have the potential to spill and may leach contaminants into the soil or water. The items containing liquid PCBs will be either unbolted or cut from their position on the vessel utilizing power saws or other non-burning tools. They will then be placed in drums in order to contain any possible spills. The drums will be placed in a bin, which will then be transferred from the vessel to the ground by a crane.

In the event that the integrity of an item's casing is suspect, the item will be removed by HAZMAT-trained personnel wearing the appropriate viton elastomer gear including disposable suits, gloves and boots. Goggles or other appropriate eye protection will also be used during handling. Prior to being removed, the questionable item will be placed in a barrel or containment bin to prevent spillage. These materials will be disposed of immediately.

All items that present no evident risk of spillage will be removed by personnel trained in PCB Awareness and in the procedures described in this section. Employees will be instructed to wear viton elastomer gloves, boots, and coveralls to prevent potential skin contact with PCB's.

Storage

Generally, PCB storage requirements apply to PCBs and PCB items that have been removed from service and are designated for disposal. Complying with the storage requirements set forth in 40 CFR 761 for PCBs involves:

- establishing a proper storage facility for PCBs;
- utilizing proper containers for PCB storage;
- managing PCB storage in accordance with marking, record keeping, and inspection requirements;
- understanding what PCBs and PCB items require storage and the various storage options that are available; and
- removal from storage and disposal of PCBs and PCB items within the 1-year disposal time limitation.

In the event that material must be stored off of the ship, American Marine's hazardous materials storage building will be used for storage. The hazardous materials storage building has been constructed in accordance with the requirements of 40 CFR 761.60. These requirements are as follows:

- The facility has an adequate roof and walls to prevent rainwater from reaching the stored PCBs and PCB Items (761.65(b)(1)(1c))
- The facility has an adequate floor that has continuous curbing with a minimum 6-inch high curb. (761.65(b)(1)(ii))
- The facility was constructed without drain valves, floor drains, expansion joints, sewer lines, or other openings that would permit liquids to flow from the curbed area. (761.65(b)(1)(iii))
- The floors and curbing have been constructed of continuous smooth and impervious materials (concrete) to prevent or minimize penetration of PCBs. (761.65(b)(1)(iv))
- The storage area is not located below the 100-year flood water elevation.

All PCB Bulk Product Waste will be removed and stored in a covered metal bin for no more than thirty days prior to disposal. In the unlikely event that there is a need to store such materials for a longer period of time, the bin will be transferred to American Marine's Regulated Material Storage Building. The building is completely roofed in order to prevent contact with any storm water discharge, which may be contaminated by PCBs. Additionally, there is a smooth cement brim as secondary containment in which all storage items will be placed (see building description in the preceding paragraph).

Although the storage of Bulk Product Waste or PCB waste is not anticipated, the following PCB items may be stored temporarily in an area that does not comply with the above requirements for up to 30 days ("thirty-day temporary storage") from the date of their removal from service, provided that a notation is attached to the PCB item or a PCB container indicating the date the item was removed from service:

- Non-leaking PCB articles and PCB equipment;
- Leaking PCB articles and PCB equipment if the PCB items are placed in a non-leaking PCB container that contains sufficient sorbent material to absorb any liquid PCB's remaining in the PCB item; and
- PCB containers containing non-liquid PCB's such as contaminated soil, rags, and debris.

Another storage option outlined in the PCB regulations is often referred to as "pallet storage". Pallet storage allows certain PCB Items to be stored temporarily on pallets next to a PCB storage facility that meets the above requirements provided that a notation is attached to the PCB Item or PCB container indicating the date the item was removed from service for disposal. These PCB items will be checked weekly when stored outside the facility. Any leaking PCB Items will be placed inside the storage area. We do not anticipate the use of pallet storage as a storage option

The storage area will be marked in accordance this program.

Containers used for the storage of PCBs (known or presumed 50 ppm or greater) will comply with the shipping container specifications of the Department of Transportation (DOT) 49 CFR 178.

Containers approved for the storage of non-liquid PCBs include:

- DOT-5 steel drum without removable head
- DOT-5B steel drum without removable head
- DOT-l7C single trip steel drum with removable head

As an alternate, containers larger than those specified in DOT specifications 5, 5B, or l7C may be used for non-liquid PCBs if the containers are designed and constructed in a manner that will provide as much protection against leaking and exposure to the environment as the specifications of other approved DOT containers (761.65(c)(6)).

PCB articles and PCB containers will be dated on the article or container when they are placed in storage. The storage will be managed so that the PCB articles and PCB containers can be located by the date that they entered storage.

All PCB storage including the DOT approved containers, "PCB storage facility" as well as "30-day temporary storage" and "pallet storage" areas will be marked/labeled in accordance with the EPA marking requirement at 40 CFR 761.40(a)(10).

American Marine will establish and maintain records on the storage and disposition of PCBs other than PCB Bulk Product Waste. PCB Bulk Product Waste will be disposed of in a solid waste landfill in accordance with 40 CFR Part 761.62(b), and as such are exempt from the requirements of subchapters C, J, and K of 40 CFR Part 761 (marking, general record keeping, and waste disposal records).

For PCB containers used for non PCB Bulk Product Waste, these records will include: container contents, PCB concentrations (ppm), the container's total volume, unique identification number, date place in transport for disposal, and the date disposed of, if known. These records will form the basis of a required "Annual Records Report" to be prepared by American Marine.

The records and documents will be maintained for at least 5 years after the facility ceases storing PCBs and PCB items. An annual document will be prepared by July 1 of each year. The "PCB Annual Document and Worksheet" (see Attachment 17-1) will be completed by July 1 of each year and maintained at the facility and

made available for inspection by representatives of the EPA during normal working hours. The operator of the facility will know the location of the records. Also kept with the annual document will be a signed manifest from the disposer for any PCB contaminated items sent for disposal.

All PCB articles and PCB containers in the PCB storage facility will be inspected for leaks at least once every 30 days. Any leaking PCB articles and PCB containers and their contents will be transferred immediately to properly marked non-leaking containers. Any PCB capacitors and PCB-contaminated electrical equipment stored adjacent to the PCB storage facility on pallets will be inspected for leaks weekly. (761.65(c)(2))

Any non-liquid PCB article or PCB container stored for disposal will be removed from storage and disposed as required within 30 days from the date when it was first placed in storage. Accumulations of liquid PCB's will be disposed of at the time they are generated, contained, and labeled.

Disposal

PCBs and PCB-containing items, after being characterized as to PCB concentration, will be contained and marked for storage and/or manifested for transportation to an approved disposal facility for disposal in accordance with 40 CFR 761.60.

American Marine has previous relationships with the above and below mentioned haulers and landfills based on other unrelated business activities. Appropriate manifests will be maintained at American Marine for the duration of the company's life.

Any liquid PCB's will be extracted and disposed of by an accredited contractor in a TSCA regulated and approved facility. Manifests will be maintained at American Marine for the duration of the company's life. Items, articles, or other PCB wastes requiring hazardous disposal will be handled by:

PCB Remediation:

Envirocon Inc.
3419 Virginia Beach Blvd # C-13
Virginia Beach, VA *23452*

PCB Transportation:

Atlantic Waste Services; Inc.
412 Oakmears Crescent (Suite 203)
Virginia Beach, VA 23462-4200
(757) 497-6194

All PCB-contaminated items requiring hazardous disposal will be disposed of by delivering same in approved containers to the following properly certified and pre-approved disposal companies:

PCB Cabling and wire: Transportation, process and disposal:

TW Services Inc.
1606 NE 3rd St.
Madison, SD 57042
Tel: 605.256.2600

Disposal arrangements will be determined based on the nature of the material and the PCB content.

PCB Disposal:

Michigan Disposal Waste Treatment Plant
Van Buren
Township, Wayne County, MI
Tel: 1 800 592-5489

Paints and other thin coatings on metal will not be required to be removed if the coated metal will be smelted domestically in a smelter meeting the definition of an industrial furnace at 40 CFR 261.10.
American Marine will maintain manifests and receipts for each shipment involving the disposal of PCB contaminated or containing items. The information kept for each shipment will include at least the following:

1. Date of shipment;
2. Approved licensed hauler name, business address, phone number, and driver name;
3. Quantity and description of materials to be disposed;
4. Location of EPA approved disposal site including address, phone number and point of contact; and
5. Manifest and receipt of disposal.

3.5 Labeling/Marking

All containers whose contents are contaminated with PCBs or self-contained items with PCBs shall be labeled with a PCB mark. This mark shall be at least 15.25 cm (6 in.) on each side with letters and border striping on a white or yellow background. Any container or item that is too small for this mark will be labeled with a label whose size is proportionately reduced.

3.6 Training of Personnel

All American Marine personnel will receive a basic PCB Awareness training course. The purpose of this course will be to ensure that all employees understand the nature of this contaminant and the potential hazards associated with it. The training will include instruction on how to properly handle and remove items that contain PCB contaminants without being directly exposed to the contaminant. An accredited training provider will conduct the training.

The training, which will consist of an interactive lecture, will include the following topics:

- What are PCBs and what are they used for.
- Where can PCBs be found.
- What to do in case one finds exposed and/or spilled PCBs.
- How to work with PCB contaminated items without exposing oneself directly to the substance.
- What kind of Personal Protective Equipment (PPE) must be worn to avoid PCB exposure.
- What are the potential health hazards posed by PCBs.

This training will be conducted at least annually, and all training certificates will be kept on file at American Marine.

There will also be a pre-operations meeting with all employees when a vessel arrives at the American Marine facility. One of the topics to be discussed will be the potential location of PCBs aboard the vessel and the schedule for sampling and removal.

4. HAZARD COMMUNICATION PROGRAM

EMPLOYEES

- Know how to recognize warning labels and how to follow their instructions.
- Know the physical and health hazards of the chemicals you use.
- Know how to protect yourself from exposure to hazardous substances.
- Know the location of material safety data sheets on site.
- Know what chemicals you may be required to use as part of your work tasks.
- Know the purpose of the Hazard Communication program and how it works.

EMPLOYER

- Train employees in the methods used to detect the presence of hazardous chemicals.
- Train employees about the physical and health hazards of the chemicals they use.
- Train employees on how they can protect themselves from exposure.
- Train employees on the elements of the Hazard Communication program and what they mean.
- Train employees how to read and understand MSDS's.

4.1 PURPOSE

The purpose of this section is to ensure that the hazards of all chemicals used by American Marine are evaluated, and that information concerning their hazards is transmitted to all American Marine employees. This transmittal of information will be accomplished by means of comprehensive hazard communication programs, which are to include container labeling and other forms of warning, material safety data sheets and employee training. This section covers requirements discussed in 29 CFR 1910.1200, "Hazard Communication."

4.2 SCOPE AND APPLICATION

American Marine shall provide information to its employees about the hazardous chemicals to which they may be exposed by means of a hazard communication program, labels and other forms of warning, material safety data sheets, and information and training. This applies to any chemical that is known to be present in the workplace in such a manner that employees may be exposed under normal conditions of use or in a foreseeable emergency.

4.3 WRITTEN HAZARD COMMUNICATION PROGRAM

A written hazard communication program which at least describes how the criteria specified in 29 CFR 1910.1200 (f), (g), and (h) for labels and other forms of warning, material safety data sheets, and employee information and training will be met will be made available at the shipyard. The program will also include the following:

- A list of the hazardous chemicals known to be present using an identity that is referenced on the appropriate material safety data sheet (the list may be compiled for the workplace as a whole or for individual work areas); and,
- The methods which will be used to inform employees of the hazards of non-routine tasks (for example, the cleaning of reactor vessels) and the hazards associated with chemicals contained in unlabeled pipes in their work areas.

4.4 MULTI-EMPLOYER WORKPLACES

Since American Marine anticipates utilizing the services of contractors, additional elements will be added to this program so that contract personnel are made aware of the chemical hazards to which they may be exposed. The hazard communication programs developed and implemented under this paragraph will include the following (in compliance with 29 CFR 1910.1200(e)):

- The methods American Marine will use to provide the other employer(s) on-site access to material safety data sheets for each hazardous chemical the other employer(s)' employees may be exposed to while working;
- The methods American Marine will use to inform the other employer(s) of any precautionary measures that need to be taken to protect employees during the workplace's normal operating conditions and in foreseeable emergencies; and,
- The methods American Marine will use to inform the other employer(s) of the labeling system used in the workplace.
- Subcontractors who provide services to American Marine will be required to furnish copies of MSDS's to American Marine for any hazardous substance that they intend to bring onto the project site.

The written hazard communication program shall be made available, upon request, to employees, their designated representatives, the Assistant Secretary and the Director, in accordance with the requirements of 29 CFR 1915.16.

4.5 LABELS AND OTHER FORMS OF WARNING

Each container of hazardous chemicals at the workplace will be labeled, tagged or marked with the following information:

- Identity of the hazardous chemical(s);
- Appropriate hazard warnings; and
- Name and address of the chemical manufacturer, importer, or other responsible party.

Each container of hazardous chemicals leaving the workplace shall be labeled, tagged, or marked in accordance with this section in a manner which does not conflict with the requirements of the Hazardous Materials Transportation Act (49 U.S.C. 1801 et seq.) and regulations issued under that Act by the Department of Transportation. If the hazardous chemical is regulated by OSHA in a substance - specific health standard, American Marine will ensure that the labels or other forms of warning used are in accordance with the requirements of that standard.

Except as provided in paragraphs (f)(6) and (f)(7) of 29 CFR 1910.1200, American Marine shall ensure that each container of hazardous chemicals in the workplace is labeled, tagged or marked with the following information:

- Identity of the hazardous chemical(s) contained therein; and,
- Appropriate hazard warnings, or alternatively, words, pictures, symbols, or combination thereof, which provide at least general information regarding the hazards of the chemicals, and which, in conjunction with the other information immediately available to employees under the hazard communication program, will provide employees with the specific information regarding the physical and health hazards of the hazardous chemical.

Signs, placards, process sheets, batch tickets, operating procedures, or other such written materials may be used in lieu of affixing labels to individual stationary process containers, as long as the alternative method identifies the containers to which it is applicable and conveys the information required by paragraph (f)(5) of this section to be on a label. The written materials will be readily accessible to the employees in their work area throughout each work shift. Portable containers into which hazardous chemicals are transferred from labeled containers, and which are intended only for the immediate use of the employee who performs the transfer may not be labeled.

Existing labels on incoming containers of hazardous chemicals will not be removed or defaced unless the container is immediately marked with the required information. Labels or other forms of warning will be legible, in English, and prominently displayed on the container, or readily available in the work area throughout each work shift. If employees who speak other languages may add the information in their language to the material presented, as long as the information is presented in English as well.

4.6 MATERIAL SAFETY DATA SHEETS

A material safety data sheet will be maintained in the workplace for each hazardous chemical that is used. Each material safety data sheet will be in English (copies in other languages may be maintained as well), and will contain at least the following information:

- The identity used on the label, and, except as provided for on trade secrets:
- If the hazardous chemical is a single substance, its chemical and common name(s);
- If the hazardous chemical is a mixture which has been tested as a whole to determine its hazards, the chemical and common name(s) of the ingredients which contribute to these known hazards, and the common name(s) of the mixture itself; or,
- If the hazardous chemical is a mixture which has not been tested as a whole:
  - The chemical and common name(s) of all ingredients which have been determined to be health hazards, and which comprise 1% or greater of the composition, except that chemicals identified as carcinogens under paragraph (d) of this section shall be listed if the concentrations are 0.1% or greater; and,
  - The chemical and common name(s) of all ingredients which have been determined to be health hazards, and which comprise less than 1% (0.1% for carcinogens) of the mixture, if there is evidence that the ingredient(s) could be released from the mixture in concentrations which would exceed an established OSHA permissible exposure limit or ACGIH Threshold Limit Value, or could present a health risk to employees; and,
  - The chemical and common name(s) of all ingredients which have been determined to present a physical hazard when present in the mixture;
- Physical and chemical characteristics of the hazardous chemical (such as vapor pressure, flash point);
- The physical hazards of the hazardous chemical, including the potential for fire, explosion, and reactivity;
- The health hazards of the hazardous chemical, including signs and symptoms of exposure, and any medical conditions which are generally recognized as being aggravated by exposure to the chemical;
- The primary route(s) of entry;

- The OSHA permissible exposure limit, ACGIH Threshold Limit Value, and any other exposure limit used or recommended by the chemical manufacturer, importer, or employer preparing the material safety data sheet, where available;
- Whether the hazardous chemical is listed in the National Toxicology Program (NTP) Annual Report on Carcinogens (latest edition) or has been found to be a potential carcinogen in the International Agency for Research on Cancer (IARC) Monographs (latest editions), or by OSHA;
- Any generally applicable precautions for safe handling and use which are known to the chemical manufacturer, importer or employer preparing the material safety data sheet, including appropriate hygienic practices, protective measures during repair and maintenance of contaminated equipment, and procedures for clean-up of spills and leaks;
- Any generally applicable control measures which are known to the chemical manufacturer, importer or employer preparing the material safety data sheet, such as appropriate engineering controls, work practices, or personal protective equipment;
- Emergency and first aid procedures;
- The date of preparation of the material safety data sheet or the last change to it; and,
- The name, address and telephone number of the chemical manufacturer, importer, employer or other responsible party preparing or distributing the material safety data sheet, who can provide additional information on the hazardous chemical and appropriate emergency procedures, if necessary.

If no relevant information is found for any given category on the material safety data sheet, the material safety data sheet shall mark it to indicate that no applicable information was found.

Copies of the required material safety data sheets for each hazardous chemical shall be maintained in the workplace and will be readily accessible during each work shift to employees when they are in their work area(s).

Material safety data sheets shall be made readily available, upon request, to designated representatives and to the Assistant Secretary, in accordance with the requirements of 29 CFR 1910.20(e). The Director shall also be given access to material safety data sheets in the same manner.

4.7 EMPLOYEE INFORMATION AND TRAINING

Employees will be supplied with effective information and training on hazardous chemicals in their work area at the time of their initial assignment and whenever a new physical or health hazard the employees have not previously been trained about is introduced into their work area. Information and training may be designed to cover categories of hazards (e.g., flammability, carcinogenicity) or specific chemicals. Chemical - specific information will always be available through labels and material safety data sheets.

4.7.1 Information

Employees will be informed of:

- The requirements of this section;
- Any operations in their work area where hazardous chemicals are present; and,
- The location and availability of the written hazard communication program, including the required list(s) of hazardous chemicals, and material safety data sheets required by this section.

4.7.2 Training

Employee training will include at least:

- Methods and observations that may be used to detect the presence or release of a hazardous chemical in the work area (such as monitoring conducted by the employer, continuous monitoring devices, visual appearance or odor of hazardous chemicals when being released, etc.);
- The physical and health hazards of the chemicals in the work area;
- The measures employees can take to protect themselves from these hazards, including specific procedures the employer has implemented to protect employees from exposure to hazardous chemicals, such as appropriate work practices, emergency procedures, and personal protective equipment to be used; and
- The details of the hazard communication program developed by the employer, including an explanation of the labeling system and the material safety data sheet, and how employees can obtain and use the appropriate hazard information.

5. HAZWOPER Training

5.1 SCOPE, APPLICATION, AND DEFINITIONS

American Marine shipyard managers, superintendents, and foreman are HAZWOPER trained and certified.

- Clean-up operations required by a governmental body, whether Federal, state local or other involving hazardous substances that are conducted at uncontrolled hazardous waste sites (including, but not limited to, the EPA's National Priority Site List (NPL), state priority site lists, sites recommended for the EPA NPL, and initial investigations of government identified sites which are conducted before the presence or absence of hazardous substances has been ascertained;
- Corrective actions involving clean-up operations at sites covered by the Resource Conservation and Recovery Act of 1976 (RCRA) as amended (42 U.S.C. 6901 et seq);
- Voluntary clean-up operations at sites recognized by Federal, state, local or other governmental bodies as uncontrolled hazardous waste sites;
- Operations involving hazardous waste that are conducted at treatment, storage, disposal (TSD) facilities regulated by 40 CFR Parts 264 and 265 pursuant to RCRA; or by agencies under agreement with U.S.E.P.A. to implement RCRA regulations; and
- Emergency response operations for releases of, or substantial threats of releases of, hazardous substances without regard to the location of the hazard.

5.2 APPLICATION

All requirements of Part 1910 and Part 1926 of Title 29 of the Code of Federal Regulations apply pursuant to their terms to hazardous waste and emergency response operations whether discussed in this section or not. If there is a conflict or overlap, the provision more protective of employee safety and health shall apply without regard to 29 CFR 1910.5(c)(1).

5.3 TRAINING

5.3.1 General

All employees working on site (such as but not limited to equipment operators, general laborers and others) exposed to hazardous substances, health hazards, or safety hazards and their supervisors and management responsible for the site shall receive training meeting the requirements of this paragraph before they are permitted to engage in hazardous waste operations that could expose them to hazardous substances, safety, or health hazards, and they shall receive review training as specified in this paragraph. Employees shall not be permitted to participate in or supervise field activities until they have been trained to a level required by their job function and responsibility.

5.3.2 Elements to be covered

The training shall thoroughly cover the following:

- Names of personnel and alternates responsible for site safety and health;
- Safety, health and other hazards present on the site;
- Use of PPE;
- Work practices by which the employee can minimize risks from hazards;
- Safe use of engineering controls and equipment on the site; and

- Medical surveillance requirements including recognition of symptoms and signs which might indicate over exposure to hazards.
-

5.3.3 Initial training

General site workers (such as equipment operators, general laborers and supervisory personnel) engaged in hazardous substance removal or other activities which expose or potentially expose workers to hazardous substances and health hazards shall receive a minimum of 40 hours of instruction off the site, and a minimum of three days actual field experience under the direct supervision of a trained experienced supervisor. Workers on site only occasionally for a specific limited task (such as, but not limited to, ground water monitoring, land surveying, or geophysical surveying) and who are unlikely to be exposed over permissible exposure limits and published exposure limits shall receive a minimum of 24 hours of instruction off the site, and the minimum of one day actual field experience under the direct supervision of a trained, experienced supervisor. Workers regularly on site who work in areas which have been monitored and fully characterized indicating that exposures are under permissible exposure limits and published exposure limits where respirators are not necessary, and the characterization indicates that there are no health hazards or the possibility of an emergency developing, shall receive a minimum of 24 hours of instruction off the site, and the minimum of one day actual field experience under the direct supervision of a trained, experienced supervisor. Workers with 24 hours of training who are covered by paragraphs (e)(3)(ii) and (e)(3)(iii) of 29 CFR 1910.120 and who become general site workers or who are required to wear respirators, shall have the additional 16 hours and two days of training necessary to total the training specified in paragraph (e)(3)(i)of 29 CFR 1910.120.

5.3.4 Management and supervisor training

On-site management and supervisors directly responsible for or who supervise employees engaged in hazardous waste operations shall receive 40 hours initial and three days of supervised field experience (the training may be reduced to 24 hours and one day if the only area of their responsibility is employees covered by paragraphs 29 CFR 1910.120 (e)(3)(ii) and (e)(3)(iii) and at least eight additional hours of specialized training at the time of job assignment on such topics as, but no limited to, American Marine's safety and health program, personal protective equipment program, spill containment program, and health hazard monitoring procedure and techniques.

5.3.5 Qualifications for trainers

Trainers shall be qualified to instruct employees about the subject matter that is being presented in training. Such trainers shall have satisfactorily completed a training program for teaching the subjects they are expected to teach, or they shall have the academic credentials and instructional experience necessary for teaching the subjects. Instructors shall demonstrate competent instructional skills and knowledge of the applicable subject matter.

5.3.6 Training certification

Employees and supervisors that have received and successfully completed the training and field experience specified in this section shall be certified by their instructor or the head instructor and trained supervisor as having completed the necessary training. A written certificate shall be given to each person so certified. Any person who has not been so certified or who does not meet the requirements of this section shall be prohibited from engaging in hazardous waste operations.

5.3.7 Emergency response

Employees who are engaged in responding to hazardous emergency situations at hazardous waste clean-up sites that may expose them to hazardous substances shall be trained in how to respond to such expected emergencies.

5.3.8 Refresher training

Employees, managers and supervisors specified in this section shall receive eight hours of refresher training annually on the items specified in this section, any critique of incidents that have occurred in the past year that can serve as training examples of related work, and other relevant topics.

5.3.9 Equivalent training

Employers who can show by documentation or certification that an employee's work experience and/or training has resulted in training equivalent to that training required in paragraphs (e)(1) through (e)(4) of 29 CFR 1910.120 shall not be required to provide the initial training requirements of those paragraphs to such employees and shall provide a copy of the certification or documentation to the employee upon request. However, certified employees or employees with equivalent training new to a site shall receive appropriate, site specific training before site entry and have appropriate supervised field experience at the new site. Equivalent training includes any academic training or the training that existing employees might have already received from actual hazardous waste site experience.

6. FIRE PREVENTION AND FIGHTING

EMPLOYEES

- Know the proper local authorities to contact in case of a fire emergency.
- Smoking is not permitted on the site where work is being performed.
- Know the location of fire extinguishers and other fire fighting equipment.
- Know the proper precautions and work procedures when using torches and welding equipment.
- Do not perform any hot work in an area which has not been certified gas-free.

EMPLOYER

- Train employees in proper fire fighting procedures. Document this training.
- Notify employees of the local authorities to contact in case of a fire emergency.
- Do not permit smoking on the site where work is being performed.
- Maintain fire extinguishers and other fire fighting equipment properly, wherever hot work is conducted.

6.1 PURPOSE

Fire protection is a science in itself. This EHS program cannot cover all aspects of fire prevention and extinguishment, but this section does present condensed, basic information to help supervise fire-safe operations. This section will help employees:

- understand the basic principles of fire safety;
- identify fire hazards, causes of fires, and safeguards required to prevent fires;
- conduct regular, periodic inspections to ensure that work areas remain in a fire-safe condition;
- understand the use and operation of fire protection equipment and systems; and
- instruct employees in the procedures for reporting fires, fighting fires, and evacuating work areas.

6.2 SCOPE

This section covers all American Marine employees. This section complies with 29 CFR Subpart L, 1910.155-1910.165 and 29 CFR 1915.52.

6.3 RESPONSIBILITIES

The Facility Manager is responsible for ensuring that all information in this section is provided to American Marine.

6.4 EDUCATION AND TRAINING REQUIREMENTS

All American Marine shall be educated on the content of this chapter.

6.5 DOCUMENTATION AND RECORDKEEPING REQUIREMENTS

Records should be kept of all inspections conducted at the American Marine facility. The record should detail what was determined from the inspection; what corrective actions were needed (if any); and who was assigned to achieve the actions. Records shall be maintained by American Marine for at least 3 years. Refer to the attached fire prevention checklist.

6.6 PROCEDURES FOR HOT WORK

6.6.1 Initial Operations

After the initial mooring of a vessel, no personnel shall enter the vessel prior to the inspection of the vessel by a marine chemist unless specifically authorized by the competent person. No smoking or open flames shall be permitted on board during tie up operations, until cutting procedures have been authorized. A competent person shall make a preliminary inspection to authorize personnel to board and begin hatch opening operations. ”Competent Person” means that American Marine shall ensure that each designated competent person has the following skills and knowledge:

1. Ability to understand and carry out written or oral information or instructions left by Marine Chemist, Coast Guard authorized persons and Certified Industrial Hygienists;
2. Knowledge of 29 CFR 1915;
3. Knowledge of the structure, location, and designation of spaces where work is done;
4. Ability to calibrate and use testing equipment including but not limited to, oxygen indicators, combustible gas indicators, carbon monoxide indicators, and carbon dioxide indicators, and to interpret accurately the test results of that equipment;
5. Ability to perform all required tests and inspections which are or may be performed by a competent person as set forth in 29 CFR 1915;
6. Ability to inspect, test, and evaluate spaces to determine the need for further testing by a Marine Chemist or a Certified Industrial Hygienist; and
7. Ability to maintain records required by this section.

The competent person for American Marine is:

Russ Francis, Safety Environmental Director
804-467-0221
757-544-5635

During the hatch opening operations, personnel shall work in groups of two or more to test previously closed spaces for oxygen concentration. No personnel shall be permitted to enter these spaces unless the test shows oxygen content to be at least 19.5%.

Torch cutting of windows for the purpose of installing gangways prior to the marine chemist’s inspection shall be performed with the specific authorization of the marine chemist. At the completion of the marine chemist’s inspection, he/she shall issue a certificate demonstrating the completion of the inspection.

6.6.2 General Operations

Cutting operations shall proceed according to the marine chemist’s instructions at the authorization of the competent person as issued to the foreman and/or lead men. A minimum of two water line hoses, not less than 1 ½” in diameter with fog nozzles, shall be fully charged and on board before the commencement of cutting.

A fire watch shall be kept during cutting operations and for a minimum period of one hour after all cutting operations cease. A fire permit from the Philadelphia Fire Department shall be obtained before any hot work is started. A visual inspection of the torches and torch hoses shall be made at the beginning of every shift and after every lunch break, with necessary repairs being made. Fire lines shall be visually inspected and tested at the beginning of each shift. All damage to the fire lines shall be repaired or the hose shall be replaced as soon as damage is noted. All hoses shall be pressure-tested and dated. Fire fighting training shall be held monthly and documented by the Safety Environmental Director.

6.6.3 End of Day Operations

Aboard ship, all gas hoses shall be moved to the existing deck and neatly coiled, with the gas turned off at the manifold. In the yard, all gas hoses shall be neatly coiled at the manifold and the supply valves closed.

6.7 BASIC PRINCIPLES

Fire is an oxidation process that emits light and heat. To sustain most fires, four elements must be available at the same time: elevated temperature, oxygen, fuel, and an uninhibited chain reaction. Fire extinguishing agents act by removing one or more of the elements.

Fire spreads from ignition source to a fuel source and to other fuel sources by conduction, convection, and radiation. Conduction transfers heat through contact with solid material. Convection transfers heat through heated air. Radiation heat transfers heat through electromagnetic waves given off by flames.

Continuous training in the fire-safe work procedures, regular inspection of work areas, and close supervision of employees job performance are the primary requirements of a successful fire prevention program.

6.8 UNDERSTANDING FIRE CHEMISTRY

Every ordinary fire (one that does not produce its own oxygen supply) results when a substance (fuel) in the presence of air (oxygen) is heated to a critical temperature, called its “ignition temperature”. Knowing this basic concept, we can understand how most fires are extinguished. The methods used include:

6.8.1 Oxygen Removal

Removing or lowering oxygen levels is difficult because a fire needs about the same amount of oxygen for burning (percentage of oxygen in the air) that humans need for breathing. Firefighting foam extinguishes fires by smothering (and cooling) action.

6.8.2 Fuel Removal

In many cases, it is neither possible nor practical to remove all fuels (solids and liquids). However, try to keep the quantity of stored combustible materials at a minimum. Good housekeeping, with the frequent removal of waste materials, is also a crucial factor in keeping a small, accidental fire from rapidly spreading.

6.8.3 Heat Source Control

Eliminating and controlling the sources are elementary steps in fire prevention. The time to stop a fire is before it starts—keep heat and ignition sources away from fuel.

To extinguish a fire, the following steps should be taken:

1. Reduce or remove the oxygen by smothering (for example, by shutting the lid over a tank of burning solvent or by covering it with foam) or by dilution (replacing the air with an inert gas such as carbon dioxide).
2. Remove or seal off the fuel by mechanical means, or divert or shut off the flow of liquids or gases fueling the fire.
3. Cool the burning material below its ignition point with a suitable cooling agent (hose streams of water extinguishers).
4. Interrupt the chemical chain reaction of the fire (using dry chemical or halon extinguishing agents).

6.8.4 Causes of Fire

When inspecting the workplace the following areas should carefully be reviewed:

6.8.4.1 Electrical Equipment

Haphazard wiring, poor connections, and temporary repairs must be brought up to standard. Cleaning electrical equipment with solvents can be hazardous because many solvents are flammable and toxic.

6.8.4.2 Friction

The friction generated by overhead transmission bearings and shafting—where dust and lint accumulate in locations such as elevators are frequent sources of ignition.

6.8.4.3 Flammable Liquids

A spark or minor source of ignition, which might otherwise be harmless, can start a fire or touch off explosive forces when flammable vapors, evaporated from liquids and then mixed with air, are present. The following should be followed to ensure safe handling of these materials:

- Flammable liquids should be stored in, and dispensed from, approved safety containers equipped with vapor-tight, self-closing caps and covers.
- Flammable liquids should be used only in rooms or areas having adequate and, if possible, positive ventilation.

The following safeguards may be required:

- An approved flammable liquids storage vault or room
- Special explosion-proof fixtures and equipment
- Automatic suppression system

- Explosive-relief devices and panels
- Self-closing faucets and safety vents for drums
- Flammable liquid storage cabinets
- Safety cans
- Special ventilating equipment

6.8.4.4 Ordinary Combustibles

Paper and wood products are often referred to as ordinary combustibles. Rack storage and solid pile storage of those materials tend to provide conditions that promote fire growth. Materials that are stacked above one another provide good flue spaces while blocking sprinkler water patterns, thus acting to spread the fire. A flue space is an area that provides for air movement thus increasing the speed at which a fire can grow.

6.8.4.5 Smoking

Smoking and no-smoking areas must be clearly defined and marked off with conspicuous signs. Fire-safe, metal containers should be provided in places where smoking is permitted.

Smoking is not permitted in the work place.

6.8.4.6 Static Electricity

Sparks due to static electricity may be a hazard whenever flammable vapors or gases exist. Precautions against static electricity are required in such areas. Static charges can be produced in many ways—for example, by the flow of gasoline through a non-conductive hose, or through the friction of machine parts.

Although it is impossible to prevent the generation of static electricity, the hazard of static sparks can be avoided by preventing the build-up of static charges. Machines should be grounded where the potential for static electricity exists.

6.8.4.7 Welding, Cutting, and Heating

When practical, employees shall move objects to be welded, cut or heated to a designated safe location or, if the object to be welded, cut or heated cannot be readily moved, all movable fire hazards including residues of combustible bulk cargoes in the vicinity shall be taken to a safe place. If the object to be welded, cut or heated cannot be moved and if all the fire hazards including combustible cargoes cannot be removed, positive means shall be taken to confine the heat, sparks, and slag, and to protect the immovable fire hazards from them. When welding, cutting or heating is performed on tank shells, decks, overheads and bulkheads, since direct penetration of sparks or heat transfer may introduce a fire hazard to an adjacent compartment, the same precautions shall be taken on the opposite side as are taken on the side on which the welding is being performed. In order to eliminate the possibility of fire in confined spaces as a result of gas escaping through leaking or improperly closed torch valves, the gas supply to the torch shall be positively shut off at some point outside the confined space whenever the torch is not to be used or whenever the torch is left unattended for a substantial period of time, such as during the lunch hour. Overnight and at the change of shifts, the torch and hose shall be removed from the confined space. Open end fuel gas and oxygen hoses shall be immediately removed from confined spaces when they are disconnected from the torch or other gas consuming device. Suitable fire extinguishing equipment shall be immediately available in the work area and shall be maintained in a state of readiness for instant use. Personnel assigned to contain fires within controllable limits shall

be instructed as to the specific anticipated fire hazards and how the fire fighting equipment provided is to be used.

6.9 EFFECTIVE HOUSEKEEPING FOR FIRE SAFETY

Good housekeeping is another important part of this fire protection program. Here are the precautions to take:

- Combustible materials should be present in work areas only in quantities required for the job.
- Quick-burning and flammable materials should be stored in designated locations.
- Vessels or pipes containing flammable liquids must be airtight.
- Passageways and fire doors should be unobstructed. Stairwell doors must never be propped open, and material should never be stored in the stairwells.
- Materials must never block automatic sprinklers or be piled around fire extinguisher locations or sprinkler and standpipe controls.

To obtain proper distribution of water, a minimum of 18 inches of clear space is required below sprinkler deflectors, heads, or devices. However, clearance of 24 to 36 inches is recommended.

6.10 FIRE PREVENTION INSPECTIONS

Fire prevention inspections have four basic goals:

1. Minimize the size of fires by ensuring that combustible and flammable material storage is controlled.
2. Control ignition sources to reduce the possibility of fire.
3. Make sure that fire protection equipment is operational.
4. Make sure that personnel exit facilities are maintained.

The following will further explain what items which need to be inspected to ensure proper fire prevention at the site. Refer to the following fire prevention checklist.

6.11 FIRE PROTECTION EQUIPMENT

Fire extinguishers should be tagged and marked with the date of the last inspection. Gauges should show charge, and seals should be in place. The inspection should ensure that the extinguishers are hung in designated locations and that access is not blocked. The nozzle should be free and clear.

6.12 FIRE PROTECTION SYSTEMS

All systems and system components should be listed by recognized testing agencies according to their fire-fighting purposes. All systems should be inspected and or tested annually or as required by manufacturers' instructions. This is also required by NFPA 24 and local jurisdiction. The systems included are sprinklers, detection systems, and alarms. Detection systems are used often to reduce the threat to life and property by providing early warning to initiate manual fire fighting or evacuation of the workplace. The best way to ensure that the proper items are inspected is to conduct a monthly inspection following a standardized checklist of procedures. Refer to the checklist which is attached for procedures to be followed.

6.13 ALARMS AND EQUIPMENT

Whenever a fire breaks out, take immediate action:

1. Sound the alarm right away regardless of the size of the fire.
2. Attempt to extinguish or control the fire with appropriate fire-extinguishing equipment, as long as a life-threatening situation does not exist.

6.13.1 Fire Alarms

All employees should be carefully instructed in how, when, and where to report a fire. Many fires get out of control simply because someone did not know how, when, or where to give the alarm.

6.13.2 Extinguishers

Before employees can combat beginning fires effectively, they must be familiar with and understand the four classes of fires that might break out in their area.

Class A

Fires in ordinary combustible materials such as wood, paper, cloth, rubber, and many plastics, where the quenching and cooling effects of water or of the solutions containing large percentages of water are of prime importance.

Class B

Fires in flammable liquids, greases, oils, tars, oil-based paints, lacquers, and similar materials, where smothering or exclusion of air and interrupting the chain reaction are most effective. This class also includes flammable gases.

Class C

Fires in or near live electrical equipment, where the use of non-conductive extinguishing agent is of first importance. The material that is burning is, however, either Class A or Class B in nature.

Class D

Fires that occur in combustible metals such as magnesium, lithium, and sodium. Special extinguishing agents and techniques are needed for fires of this type.

Workers should practice the use of portable fire extinguishers and hoses at least yearly if they will be expected to use the equipment in the event of a fire at the facility. All fire extinguishers must bear an approved label detailing the class of fire it is intended to combat. Check to see that extinguishers are not blocked by material or equipment and that signs indicating their location are clear and conspicuous. Periodic inspection and servicing of portable fire-extinguishing equipment should be performed and deficiencies relayed to those who will make corrective actions.

When inspecting fire extinguishers, they must meet the following requirements:

- Be kept fully charged and in their designated places.
- Be located along normal paths of travel where practical.
- Not be obstructed or obscured from view.
- Not be mounted higher than 5 feet (to the top of the extinguisher) if they weigh 40 pounds or less.
- Be inspected at least monthly, to make sure that they are in their designated places, have not been tampered with or actuated, and do not have corrosion or other impairment.
- Be examined at least yearly and/or recharged or repaired to ensure operability and safety. A tag must be attached to show the maintenance or recharge date and the signature or initials of the person performing the service.
- Be selected on the basis of type of hazard, degree of hazard, and area to be protected.

6.14 EVACUATION

Prevention is the primary objective of any fire protection program. Nevertheless, this program must include provisions to ensure the safety of employees in the event of a fire.

We can do much to prepare for the safety of employees in the event of a serious fire. We should make sure that each employee knows the evacuation alarms, both primary and alternate exit and escape routes, what to do, and where to be during and after an evacuation. We should make sure that each person knows that he or she, upon being alerted, must proceed at a fast walking pace—not a run—to an assigned exit or, if it is blocked, to the nearest clear one. Oral instructions regarding evacuation procedures shall be given, and printed information describing these policies to all affected employees or occupants shall be distributed.

6.15 PROGRAM AUDIT

The requirements of this section shall be reviewed annually to ensure the workplace has not changed and all employees understand the procedures discussed herein.

FIRE PREVENTION CHECKLIST
American Marine Group
DATE OF INSPECTION _____
PERFORMED BY _____

ELECTRICAL EQUIPMENT

- ☐ No makeshift wiring
- ☐ Extension cords serviceable
- ☐ Motor and tools free of dirt and grease
- ☐ Lights clear of combustible
- ☐ Safest cleaning solvents used
- ☐ Fuse and control boxes clean and closed
- ☐ Circuits properly fused or otherwise protected
- ☐ Equipment approved for use in hazardous areas (if required)
- ☐ Ground connections clean and tight and have electrical continuity

FRICTION

- ☐ Machinery properly lubricated
- ☐ Machinery properly adjusted and/or aligned

SPECIAL FIRE-HAZARD MATERIALS

- ☐ Storage of special flammables isolated
- ☐ Nonmetal stock free of tramp metal

WELDING AND CUTTING

- ☐ Area surveyed for fire safety
- ☐ Combustibles removed or covered
- ☐ Permit issued

OPEN FLAMES

- ☐ Kept away from spray rooms and booths
- ☐ Portable torches clear of flammable surfaces
- ☐ No gas leaks

PORTABLE HEATERS

- ☐ Set up with ample horizontal and overhead clearances
- ☐ Secured against tipping or upset
- ☐ Combustibles removed or covered
- ☐ Safely mounted on non-combustible surface
- ☐ Not used as rubbish burners
- ☐ Use of steel drums prohibited

HOT SURFACES

- ☐ Hot pipes clear of combustible materials
- ☐ Ample clearance around boilers and furnaces
- ☐ Soldering irons kept off combustible surfaces
- ☐ Ashes in metal containers

SMOKING AND MATCHES

- ☐ "No smoking" and "smoking" areas clearly marked
- ☐ Butt containers available and serviceable
- ☐ No discarded smoking materials in prohibited areas

SPONTANEOUS IGNITION

- ☐ Flammable waste material in closed, metal containers
- ☐ Flammable waste material containers emptied frequently
- ☐ Piled material, cool, dry and well ventilated
- ☐ Trash receptacles emptied daily

STATIC ELECTRICITY

- ☐ Flammable liquid dispensing vessels grounded or bonded
- ☐ Moving machinery grounded
- ☐ Proper humidity maintained

HOUSKEEPING

- ☐ No accumulations of rubbish
- ☐ Safe storage of flammables
- ☐ Passageways clear of obstacles
- ☐ Automatic sprinklers unobstructed
- ☐ Premises free of unnecessary combustible materials
- ☐ No leaks or dripping of flammables and floor free of spills
- ☐ Fire doors unblocked and operating freely with fusible links intact

EXTINGUISHING EQUIPMENT

- ☐ Proper type
- ☐ In proper location
- ☐ Access unobstructed
- ☐ Clearly marked
- ☐ In working order
- ☐ Service date current
- ☐ Personnel trained in use of equipment

*Attach a list of all corrective actions and who will perform them.

7. Personal Protective Equipment (PPE)

EMPLOYEES

- Wear all personal protective equipment as required.
- Ensure that all equipment fits properly.
- Use personal protective equipment properly at all times.
- Use only safety glasses, shields, and other protective gear that has been provided by American Marine
- Use respirators as you have been trained.
- Assure that a proper fit is maintained at all times.
- Be sure that a proper seal is maintained whenever respirator is used.
- Store and maintain respirators as you have been instructed.

EMPLOYER

- Train all employees on how to properly use the respirators and other PPE.
- Provide all required personal protective equipment to employees.
- Ensure that all equipment fits employees properly.
- Require that personal protective equipment be properly used.
- Document the maintenance of all personal protective equipment.
- Document employee training on the use of personal protective equipment.
- Ensure safety glasses, shields, and other protective gear meet the appropriate ANSI standards.
- Evaluate tasks that require the use of respirators.
- Select the appropriate respirator based on the level of airborne contaminants and environmental conditions of exposure.
- Ensure that all persons wearing respirators have been medically evaluated for fitness.
- Fit test persons required to wear respirators.
- Properly store and maintain respirators.

7.1 PURPOSE

This program is designed to ensure protection of American Marine employees from physical and chemical hazards. American Marine employees are required to wear personal protective equipment in various situations as defined in Attachment 1 of this chapter. OSHA requires that American Marine will supply the equipment at no cost to the affected employees.

7.2 SCOPE

Based on the hazard determination at the worksite, various American Marine employees shall be required to wear personal protective equipment (PPE). If employees enter an area marked to require PPE, they must comply with those markings. This section complies with 29 CFR Subpart I, 1910.132-1910.136.

7.3 DEFINITIONS

American Marine employees refer to American Marine employees only.

Personal Protective Equipment (PPE) means equipment such as gloves, hardhats, safety glasses, and respirators that protect employees from various hazards that they are exposed to during the workday.

"Don" refers to the action of putting the equipment on.

"Doff" refers to the action of removing the equipment.

7.4 RESPONSIBILITIES

Environmental Profiles, Inc., acting as safety and health consultant to American Marine, is responsible for ensuring that the hazard determination has been performed, correct PPE has been selected, all affected employees are wearing the required PPE, and each employee has received all of the required training.

7.5 EDUCATION AND TRAINING REQUIREMENTS

The employer shall provide training to each employee who is required by this section to use PPE. The training requirements can be found in 29 CFR 1910.132 (f). It includes the following:

- When PPE is necessary;
- What PPE is necessary;
- How to properly don, doff, adjust and wear PPE;
- The limitation of the PPE; and
- The proper care, maintenance, useful life and disposal of the PPE.

Before being allowed to perform work where PPE is required, each affected employee must demonstrate an understanding of the training.

Retraining is required when there are:

- changes to the workplace making previous training obsolete;
- changes to the PPE making previous training obsolete; and
- knowledge or use of assigned PPE indicated that the employee has not retained the requisite understanding or skill.

7.6 WRITTEN PROGRAM REQUIREMENTS

All areas of the workplace must be evaluated. Based on this evaluation, PPE requirements must be defined. This information must be provided in writing to all affected employees.

7.7 DOCUMENTATION AND RECORDKEEPING REQUIREMENTS

Written certification shall be provided to verify that a required workplace hazard assessment has been performed. The form will identify:

- The workplace evaluated;

- The person certifying that the evaluation has been performed;
- The date(s) of the hazard assessment; and
- Identify the document as the certification of hazard assessment.

An example of this form can be found in Attachment 1.

The employer shall verify that each employee has received training. Written documentation of training is required. All training records must include the name of employee trained, the dates(s) of training, and identify the subject of certification.

7.8 GENERAL REQUIREMENTS

PPE alone shall not be used to provide protection against hazards. PPE should be used in conjunction with guards, engineering controls, and sound work practices.

When PPE is required, the equipment shall be provided, used and maintained in sanitary and reliable condition, as necessary, to protect employees from workplace hazards.

Where employees provide their own equipment, the employer shall assure the adequacy, including the proper maintenance and sanitation, of such equipment. (29 CFR 1910.132 (b))

All PPE must be of safe design and construction for the work to be performed.

7.9 WORK PLACE HAZARDS ASSESSMENT

It is necessary to assess the foot, head, eye and face, and hand hazard situations that exist in the occupational setting so that protective devices can be selected to match the particular hazard.

A walk-through survey of all areas in question shall be conducted. The purpose of the survey is to identify sources of hazards to workers and co-workers. Consideration shall be given to the following basic hazard categories:

- Impact
- Penetration
- Compression (roll-over)
- Chemical
- Heat (Cold)
- Harmful dust
- Light (optical) radiation
- Noise
- Electrical

During the walk-through survey, the following should be observed:

- Sources of Motion
  (i.e., machinery or processes where any movement of tools, machine elements or particles could exist, or movement of personnel that could result in collision with stationary objects.)
- Sources of high temperatures that could result in burns, eye injury or ignition of protective equipment, etc.
- Types of chemical exposure
- Sources of light radiation

(i.e., welding, brazing, cutting, furnaces, heat treating, high intensity lights.)

- Sources of falling objects or potential for dropping objects
- Sources of sharp objects which might pierce the feet or cut the hands
- Layout of the workplace and location of co-workers
- Any electrical hazards
- Injury/accident data should be reviewed to help identify problem areas

Organize the data to prepare for analysis of the hazards in the environment to enable proper selection of protective equipment.

Analyze the data to estimate the potential for injury.

Each of the basic hazards should be reviewed and a determination made as to the type, level of risk and seriousness of potential injury for each of the hazards found in the area. Exposure to multiple hazards simultaneously should be considered. The workplace needs to be reassessed as necessary.

7.10 GENERAL SELECTION GUIDELINES

After the workplace has been assessed and the need for PPE established, the selection of the best equipment shall be made.

The selection of the PPE shall follow these general guidelines:

- Become familiar with the potential hazards and type of protective equipment that is available, and what it can do; (i.e., splash protection, impact protection, etc.)
- Compare the hazards associated with the environment; (i.e., impact velocities, masses, projectile shape, radiation, intensities, with the capabilities of the available protective equipment.)
- Select the protective equipment that ensures a level of protection greater than the minimum required to protect employees from the hazards.

7.11 RESPIRATORS

7.11.1 Limits of Respirator Usage

Engineering control measures will be used per paragraph 1-3. Compliance with PELs will not be achieved solely by the use of respirators except under the following conditions:

- During the time period necessary to implement engineering control measures;
- In work situations in which the control methods prescribed are not technically feasible or are not sufficient to reduce the airborne concentration of lead particulates below the PEL; and
- During emergencies.

A respirator program will be established as described in 29 CFR 1910.134. Where a respirator is required, it will be National Institute for Safety and Health and Mine Safety and Health Administration approved.

Qualitative fit tests will be required for all respirator users at the time of initial fitting and at least every six (6) months thereafter for all users of negative pressure respirators.

Breathing air or sources of breathing air for supplied air respirators or self-contained breathing apparatuses (SCBAS) will comply with the requirements in 29 CFR 1910.134. An employee will not be assigned to tasks requiring the use of a respirator if, base upon the employee's most recent medical examination, documentation reveals that the employee will be unable to function normally wearing a respirator or that the safety or health of the employee will be impaired by his/her use of a respirator. A powered air-purifying respirator with HEPA filter will be provided in lieu of a half full-face piece respirator if the employee chooses to use this respirator and it provides adequate protection. A respirator will be provided to employees who work with lead, upon request. Such employees will be entered into the respiratory protection program.

7.11.2 Respirator Selection

Proper selection of respirators shall be made according to the guidance of American National Standard Practices for Respiratory Protection Z88.2-1969.

Permissible practice

In the control of those occupational diseases caused by breathing air contaminated with harmful dusts, fogs, fumes, mists, gases, smokes, sprays, or vapors, the primary objective shall be to prevent atmospheric contamination. This shall be accomplished as far as feasible by accepted engineering control measures (for example, enclosure or confinement of the operation, general and local ventilation, and substitution of less toxic materials). When effective engineering controls are not feasible, or while they are being instituted, appropriate respirators shall be used pursuant to the following requirements.

American Marine will provide respirators when such equipment is necessary to protect the health of the employee. The employer shall provide the respirators that are applicable and suitable for the purpose intended. The employer shall be responsible for the establishment and maintenance of a respiratory protective program that shall include the requirements outlined in paragraph (b) of this section.

The employee shall use the provided respiratory protection in accordance with instructions and training received.

Written standard operating procedures governing the selection and use of respirators shall be established.

Respirators shall be selected on the basis of hazards to which the worker is exposed.

The user shall be instructed and trained in the proper use of respirators and their limitations.

Respirators shall be regularly cleaned and disinfected. Those used by more than one worker shall be thoroughly cleaned and disinfected after each use.

Respirators shall be stored in a convenient, clean, and sanitary location.

Respirators used routinely shall be inspected during cleaning. Worn or deteriorated parts shall be replaced. Respirators for emergency use such as self-contained devices shall be thoroughly inspected

at least once a month and after each use.

Appropriate surveillance of work area conditions and degree of employee exposure or stress shall be maintained.

There shall be regular inspection and evaluation to determine the continued effectiveness of the program.

Persons should not be assigned to tasks requiring use of respirators unless it has been determined that they are physically able to perform the work and use the equipment. The local physician shall determine what health and physical conditions are pertinent. The respirator user‘s medical status should be reviewed periodically (for instance, annually).

Respirators shall be selected from among those approved by the National Institute for Occupational Safety and Health under the provisions of 30 CFR Part 11 and 29 CFR 1910.134.

Selection of respirators

Proper selection of respirators shall be made according to the guidance of American National Standard Practices for Respiratory Protection Z88.2-1969.

Air quality

Compressed air, compressed oxygen, liquid air, and liquid oxygen used for respiration shall be of high purity. Oxygen shall meet the requirements of the United States Pharmacopoeia for medical or breathing oxygen. Breathing air shall meet at least the requirements of the specification for Grade D breathing air as described in Compressed Gas Association Commodity Specification G-7.1-1966. Compressed oxygen shall not be used in supplied-air respirators or in open circuit self-contained breathing apparatus that have previously used compressed air. Oxygen must never be used with air line respirators.

Breathing air may be supplied to respirators from cylinders or air compressors.

Cylinders shall be tested and maintained as prescribed in the Shipping Container Specification Regulations of the Department of Transportation (49 CFR Part 178).
The compressor for supplying air shall be equipped with necessary safety and standby devices. A breathing air-type compressor shall be used. Compressors shall be constructed and situated so as to avoid entry of contaminated air into the system and suitable in-line air purifying sorbent beds and filters installed to further assure breathing air quality. A receiver of sufficient capacity to enable the respirator wearer to escape from a contaminated atmosphere in event of compressor failure, and alarms to indicate compressor failure and overheating shall be installed in the system. If an oil-lubricated compressor is used, it shall have a high-temperature or carbon monoxide alarm, or both. If only a high-temperature alarm is used, the air from the compressor shall be frequently tested for carbon monoxide to insure that it meets the specifications in paragraph (d)(1) of this section.

Air line couplings shall be incompatible with outlets for other gas systems to prevent inadvertent servicing of air line respirators with nonrespirable gases or oxygen.
Breathing gas containers shall be marked in accordance with American National Standard Method of Marking Portable Compressed Gas Containers to Identify the Material Contained,

Z48.1-1954; Federal Specification BB-A-1034a, June 21, 1968, Air, Compressed for Breathing Purposes; or Interim Federal Specification GG-B-00675b, April 27, 1965, Breathing Apparatus, Self-Contained.

Use of respirators

Standard procedures shall be developed for respirator use. These should include all information and guidance necessary for their proper selection, use, and care. Possible emergency and routine uses of respirators should be anticipated and planned for.

The correct respirator shall be specified for each job. The respirator type is usually specified in the work procedures by a qualified individual supervising the respiratory protective program. The individual issuing them shall be adequately instructed to insure that the correct respirator is issued.

Written procedures shall be prepared covering safe use of respirators in dangerous atmospheres that might be encountered in normal operations or in emergencies. Personnel shall be familiar with these procedures and the available respirators.

In areas where the wearer, with failure of the respirator, could be overcome by a toxic or oxygen-deficient atmosphere, at least one additional man shall be present. Communications (visual, voice, or signal line) shall be maintained between both or all individuals present. Planning shall be such that one individual will be unaffected by any likely incident and have the proper rescue equipment to be able to assist the other(s) in case of emergency.

When self-contained breathing apparatus or hose masks with blowers are used in atmospheres immediately dangerous to life or health, standby men must be present with suitable rescue equipment.

Persons using air line respirators in atmospheres immediately hazardous to life or health shall be equipped with safety harnesses and safety lines for lifting or removing persons from hazardous atmospheres or other and equivalent provisions for the rescue of persons from hazardous atmospheres shall be used. A standby man or men with suitable self-contained breathing apparatus shall be at the nearest fresh air base for emergency rescue.

Respiratory protection is no better than the respirator in use, even though it is worn conscientiously. Frequent random inspections shall be conducted by a qualified individual to assure that respirators are properly selected, used, cleaned, and maintained.

For safe use of any respirator, it is essential that the user be properly instructed in its selection, use, and maintenance. Both supervisors and workers shall be so instructed by competent persons. Training shall provide the men an opportunity to handle the respirator, have it fitted properly, test its face-piece-to-face seal, wear it in normal air for a long familiarity period, and, finally, to wear it in a test atmosphere.

Every respirator wearer shall receive fitting instructions including demonstrations and practice in how the respirator should be worn, how to adjust it, and how to determine if it fits properly. Respirators shall not be worn when conditions prevent a good face seal. Such conditions may be a growth of beard, sideburns, a skull cap that projects under the facepiece, or temple pieces on glasses. Also, the absence of one or both dentures can seriously affect the fit of a facepiece. The worker’s diligence in observing these factors shall be evaluated by periodic check. To assure proper protection, the facepiece fit shall be checked by the wearer each time he puts on the respirator. This may be done by following the manufacturer‘s facepiece fitting instructions.

Providing respiratory protection for individuals wearing corrective glasses is a serious problem. A proper seal cannot be established if the temple bars of eye glasses extend through the sealing edge of

the full facepiece. As a temporary measure, glasses with short temple bars or without temple bars may be taped to the wearer's head. Wearing of contact lenses in contaminated atmospheres with a respirator shall not be allowed. Systems have been developed for mounting corrective lenses inside full facepieces. When a workman must wear corrective lenses as part of the facepiece, the facepiece and lenses shall be fitted by qualified individuals to provide good vision, comfort, and a gas-tight seal.

If corrective spectacles or goggles are required, they shall be worn so as not to affect the fit of the facepiece. Proper selection of equipment will minimize or avoid this problem.

Maintenance and care of respirators

A program for maintenance and care of respirators shall be adjusted to the type of plant, working conditions, and hazards involved, and shall include the following basic services:

Inspection for defects (including a leak check), Cleaning and disinfecting, Repair, and Storage

Equipment shall be properly maintained to retain its original effectiveness.

All respirators shall be inspected routinely before and after each use. A respirator that is not routinely used but is kept ready for emergency use shall be inspected after each use and at least monthly to assure that it is in satisfactory working condition.

Self-contained breathing apparatus shall be inspected monthly. Air and oxygen cylinders shall be fully charged according to the manufacturer‘s instructions. It shall be determined that the regulator and warning devices function properly.

Respirator inspection shall include a check of the tightness of connections and the condition of the facepiece, headbands, valves, connecting tube, and canisters. Rubber or elastomer parts shall be inspected for pliability and signs of deterioration. Stretching and manipulating rubber or elastomer parts with a massaging action will keep them pliable and flexible and prevent them from taking a set during storage.

A record shall be kept of inspection dates and findings for respirators maintained for emergency use.

Routinely used respirators shall be collected, cleaned, and disinfected as frequently as necessary to insure that proper protection is provided for the wearer. Respirators maintained for emergency use shall be cleaned and disinfected after each use.

Replacement or repairs shall be done only by experienced persons with parts designed for the respirator. No attempt shall be made to replace components or to make adjustment or repairs beyond the manufacturer's recommendations. Reducing or admission valves or regulators shall be returned to the manufacturer or to a trained technician for adjustment or repair.

After inspection, cleaning, and necessary repair, respirators shall be stored to protect against dust, sunlight, heat, extreme cold, excessive moisture, or damaging chemicals. Respirators placed at stations and work areas for emergency use should be quickly accessible at all times and should be stored in compartments built for the purpose. The compartments should be clearly marked. Routinely used respirators, such as dust respirators, may be placed in plastic bags. Respirators should not be stored in such places as lockers or tool boxes unless they are in carrying cases or cartons.

Respirators should be packed or stored so that the facepiece and exhalation valve will rest in a normal position and function will not be impaired by the elastomer setting in an abnormal position.

Instructions for proper storage of emergency respirators, such as gas masks and self-contained breathing apparatus, are found in "use and care" instructions usually mounted inside the carrying case

lid.

Identification of gas mask canisters.

The primary means of identifying a gas mask canister shall be by means of properly worded labels. The secondary means of identifying a gas mask canister shall be by a color code.

All who issue or use gas masks falling within the scope of this section shall see that all gas mask canisters purchased or used by them are properly labeled and colored in accordance with these requirements before they are placed in service and that the labels and colors are properly maintained at all times thereafter until the canisters have completely served their purpose.

On each canister shall appear in bold letters the following:

> Canister for _____ (Name for atmospheric contaminant) or Type N Gas Mask Canister

In addition, essentially the following wording shall appear beneath the appropriate phrase on the canister label:

> **"For respiratory protection in atmospheres containing not more than _____ percent by volume of _____." (Name of atmospheric contaminant)**

Canisters having a special high-efficiency filter for protection against radionuclides and other highly toxic particulates shall be labeled with a statement of the type and degree of protection afforded by the filter. The label shall be affixed to the neck end of, or to the gray stripe which is around and near the top of, the canister. The degree of protection shall be marked as the percent of penetration of the canister by a 0.3-micron-diameter dioctyl phthalate (DOP) smoke at a flow rate of 85 liters per minute.

Each canister shall have a label warning that gas masks should be used only in atmospheres containing sufficient oxygen to support life (at least 16 percent by volume), since gas mask canisters are only designed to neutralize or remove contaminants from the air.

Each gas mask canister shall be painted a distinctive color or combination of colors indicated in Table I-1. All colors used shall be such that they are clearly identifiable by the user and clearly distinguishable from one another. The color coating used shall offer a high degree of resistance to chipping, scaling, peeling, blistering, fading, and the effects of the ordinary atmospheres to which they may be exposed under normal conditions of storage and use. Appropriately colored pressure sensitive tape may be used for the stripes.

TABLE I-1

Atmospheric contaminants to be protected against	**Colors assigned[(1)]**
Acid gases	White
Hydrocyanic acid gas	White with 12 inch green stripe completely around the canister near the bottom
Chlorine gas	White with 12 inch yellow stripe completely around the canister near the bottom
Organic vapors	Black
Ammonia gas	Green

Acid gases and ammonia gases	Green with 12-inch white stripe completely around the canister near the bottom
Carbon monoxide	Blue
Acid gases and organic vapors	Yellow
Hydrocyanic acid gas and chloropicrin vapor	Yellow with 12-inch blue stripe completely around the canister near the bottom
Acid gases, organic vapors, and ammonia gases	Brown
Radioactive materials, excepting tritium and noble gases	Purple (magenta)
Particulates (dusts, fumes, mists, fogs, or smokes) in combination with any of the above gases or vapors	Canister color for contaminant, as designated above, with 12-inch gray stripe completely around the canister near the top
All of the above atmospheric contaminants	Red with 12-inch gray stripe completely around the canister near the top

Footnote(1) Gray shall not be assigned as a main color for a canister designed to remove acids or vapors.

NOTE: Orange shall be used as a complete body, or stripe color to represent gases not included in this table. The user will need to refer to the canister label to determine the degree of protection the canister will afford

7.12 SELECTION GUIDELINES FOR EYE AND FACE PROTECTION

Each affected employee shall use appropriate eye or face protection when exposed to eye or face hazards from flying, particles, molten metal, liquid chemicals, acids or caustic liquids, chemical gases or vapors, or potentially injurious light radiation. Side protection must be provided where there is a hazard from flying objects.

Each affected employee who wears prescription lenses while engaged in operations that involve eye hazards shall wear eye protection that incorporates the prescription in its design. They may also wear eye protection that can be worn over prescription lenses without disturbing the proper position of the lenses.

Criteria (29 CFR 1910.133):

Protective eye and face devices purchased after 5 July 1994, shall comply with ANSI Z87.1-1989, "American National Standard Practice for Occupational and Educational Eye and Face Protection." If devices were purchased prior to 5 July 1994, they shall comply with Z87.1-1969.

7.13 SELECTION GUIDELINES FOR HEAD PROTECTION

All head protection (helmets) are designed to provide protection from impact and penetration hazards caused by falling objects. There are three classes of helmets. The following table list the three classes.

Class **Protection**

Class	Protection
Class A Helmet	In addition to impact and penetration resistance, provide electrical protection from low-voltage conductors (they are proof tested to 2,200 volts).
Class B Helmet	In addition to impact and penetration resistance, provide electrical protection from high-voltage conductors (they are proof tested to 20,000 volts).
Class C Helmet	Provide impact and penetration resistance (they are usually made of aluminum which conducts electricity) and should not be used around electrical hazards.

Each employee shall wear protective helmets when there is a potential for injury to the head from falling objects.

Helmets produced to reduce electrical shock hazards shall be worn by each employee exposed to electrical conductors which could contact the head.

Criteria (29 CFR 1910.135):

Protective helmets purchased after 5 July 1994 shall comply with ANSI-Z89.1-1986. If equipment was purchased prior to 5 July 1995, they shall comply with ANSI-Z89.1-1969.

7.14 SELECTION GUIDELINES FOR FOOT PROTECTION

Where necessary, safety shoes need to provide both impact and compression protection. Shoes in special situations need to provide puncture protection, and special electrical situations conductive or insulating safety shoes would be appropriate, and in other situations metatarsal protective shoes (steel-tipped shoes) need to be provided.

Protective footwear shall be worn where there is a danger of foot injuries due to falling and rolling objects, or objects piercing the sole, and where the employee's feet might be exposed to electric hazards.

Criteria (29 CFR 1910.136):

Protective footwear purchased after 5 July 1994 shall comply with ANSI Z41-1991. Any footwear purchased prior to 5 July 1994 shall comply with ANSI-Z41.1-1967.

7.15 SELECTION GUIDELINES FOR HAND PROTECTION (29 CFR 1910.138)

Gloves are often relied upon to prevent cuts, abrasions, burns and skin contact with chemicals that are capable of causing local and systemic effects following dermal exposure. It is important to select the most appropriate glove for a particular application and to determine how long it can be worn, and whether it can be reused. Before purchasing gloves, the employer should request documentation from the manufacturer that the gloves meet the appropriate test standards(s) for the hazard(s) anticipated.

Factors to be considered for glove selection in general include:

- As long as performance characteristics are acceptable, it may be more cost effective to regularly change cheaper gloves than to reuse more expense types.

- The work activities of the employee should be studied to determine the degree of dexterity required, the duration, the frequency, and degree of exposure of the hazard, and the physical stresses that will be applied.

With respect to selection of gloves for protection against chemical hazards:

- The toxic properties of the chemical(s) must be determined; in particular, the ability of the chemical to cause local effects on the skin and/or to pass through the skin and cause systemic effects.
- Generally, any "chemical resistant" glove can be used for dry powders.
- For mixtures and formulated products (unless specific test data are available), a glove should be selected on the basis of the chemical component with the shortest break-through time, since it is possible for solvents to carry active ingredients through polymetric materials.
- Employees must be able to remove the gloves in such a manner as to prevent skin contamination.

Appropriate hand protection shall be provided when employee hands are exposed to hazards such as those from skin absorption of hazardous substances, severe cuts or lacerations, severe abrasions, punctures, chemical burns, thermal burns, and harmful temperature extremes. Refer to Attachment 1 to determine when gloves are required.

7.16 FITTING THE SELECTED PPE

Careful consideration should be given to comfort and fit. Ensure the right fit of equipment because continued wearing of the device is more likely if it fits the wearer comfortably. Particular care should be taken in fitting devices on equipment that is adjustable.

7.17 CLEANING AND MAINTENANCE

All PPE must be kept clean and properly maintained (29 CFR 1910.132 (a)). PPE should be inspected, cleaned and maintained at regular intervals. It is important to ensure that contaminated PPE that cannot be decontaminated is disposed of in a manner that protects employees from exposure to hazards.

7.18 PROGRAM AUDIT

Inspections should be conducted at least annually to ensure the proper selection and use of PPE. An annual hazard assessment should also be performed to ensure the potential hazards have not changed and the selected PPE is sufficient to provide a safe work environment.

ATTACHMENT

PPE REQUIREMENTS
BASED ON THE HAZARD ASSESSMENT

PPE HAZARD ASSESSMENT TABLE

HAZARD SOURCE	HAZARD[1]	OPERATION	ROOM/AREA	ASSESSMENT OF HAZARDS	RISK	PPE	PPE CRITERIA[2]
Chemicals	H	Laboratory operations	All labs	Splash - acids and chemicals during handling. Absorption - acids and chemicals during handling	Burns and irritation to hands, face, body. Irritation of and absorption into the hands.	spectacles* lab coat shoes gloves	Z87 full length no open toes chemical specific

1. Categories include: A: Impact; B: Penetration; C: Compression; D: Chemical; E: Heat; F: Harmful dust; G: Light radiation; H: Noise.
2. Footwear = ANSI Z41.1991; Head Protection = ANSI Z899.1; Hand protection = Region 9 protocol; Eye and Face Protection = ANSI Z87.1 1989.

* Spectacles are being specified for laboratory splash hazards for both laboratory operators and visitors. Spectacles are considered a downgrade for laboratory operators and an upgrade for visitors. Goggles are preferable for laboratory operations where the splash hazard is greater (transferring liquids from containers at least 4 liters in volume), or during the bulk handling of chemicals and wastes.

Workplace Assessed: _____
Person Certifying the Assessment: _____
Date of Assessment: _____

This documentation is the certification of the hazard assessment

8. Confined and Enclosed Spaces and Other Dangerous Atmospheres

EMPLOYEES

- Do not enter spaces that have not been cleared for entry.
- Do not enter confined spaces unless you have received proper training.
- Do not enter confined spaces without another worker present immediately outside of the space.

EMPLOYER

- Define the confined spaces present or possibly presented.
- Do not enter spaces that have not been cleared for entry.
- Allow only workers who have been trained in confined space entry to enter confined spaces.
- Do not allow workers to enter confined spaces without another worker present immediately outside of the space.
- A rescue team must be provided which has been trained in confined space rescue procedures. This team may be composed of either American Marine employees or it may be an outside rescue team that can respond promptly in the event of an emergency.
- Records must be kept to document employee training and the training of a competent person who is responsible for clearing spaces for entry.

8.1 PURPOSE

American Marine has developed this confined space entry program to outline requirements, equipment needs, and procedures necessary to conduct safe operations in confined space situations.

8.2 SCOPE AND APPLICATION

This Section applies to work in confined and enclosed spaces and other dangerous atmospheres in the American Marine work place, including vessels, vessel sections, and on land-side operations regardless of geographic location.

8.3 DEFINITIONS

"Adjacent spaces" means those spaces bordering a subject space in all directions, including all points of contact, corners, diagonals, decks, tank tops, and bulkheads.

"Assistant Secretary" means the Assistant Secretary of Labor for Occupational Safety and Health, or designated representative.

"Certified Industrial Hygienist (CIH)" means an industrial hygienist who is certified by the American Board of Industrial Hygiene.

"Coast Guard authorized person" means an individual who meets the requirement of Appendix B to subpart B of this part 1915 for tank vessels, for passenger vessels, and for cargo and miscellaneous vessels.

”Competent Person” means that American Marine shall ensure that each designated competent person has the following skills and knowledge:

(1) Ability to understand and carry out written or oral information or instructions left by Marine Chemist, Coast Guard authorized persons and Certified Industrial Hygienists;
(2) Knowledge of 29 CFR 1915;
(3) Knowledge of the structure, location, and designation of spaces where work is done;
(4) Ability to calibrate and use testing equipment including but not limited to, oxygen indicators, combustible gas indicators, carbon monoxide indicators, and carbon dioxide indicators, and to interpret accurately the test results of that equipment;
(5) Ability to perform all required tests and inspections which are or may be performed by a competent person as set forth in 29 CFR 1915;
(6) Ability to inspect, test, and evaluate spaces to determine the need for further testing by a Marine Chemist or a Certified Industrial Hygienist; and
(7) Ability to maintain records required by this section.

"Dangerous atmosphere" means an atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue (i.e., escape unaided from a confined or enclosed space), injury, or acute illness.

"Director" means the Director of the National Institute for Occupational Safety and Health, U.S. Department of Health and Human Services, or designated representative.

"Enter with Restrictions" denotes a space where entry for work is permitted only if engineering controls, personal protective equipment, clothing, and time limitations are as specified by the Marine Chemist, Certified Industrial Hygienist, or the shipyard competent person.

"Entry" means the action by which a person passes through an opening into a space. Entry includes ensuing work activities in that space and is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the space.

"Hot" work means any activity involving riveting, welding, burning, the use of powder-actuated tools or similar fire-producing operations. Grinding, drilling, abrasive blasting, or similar spark-producing operations are also considered hot work except when such operations are isolated physically from any atmosphere containing more than 10 percent of the lower explosive limit of a flammable or combustible substance.

"Immediately" dangerous to life or health (IDLH) means an atmosphere that poses an immediate threat to life or that is likely to result in acute or immediate severe health effects.

"Inert" or "inerted atmosphere" means an atmospheric condition where:

1. The oxygen content of the atmosphere in the space is maintained at a level equal to or less than 8 percent by volume or at a level at or below 50 percent of the amount required to support combustion, whichever is less; or
2. The space is flooded with water and the vapor concentration of flammable or combustible materials in the free space atmosphere above the water line is less than 10 percent of the lower explosive limit for the flammable or combustible material.

"Labeled" means identified with a sign, placard, or other form of written communication, including pictograms, that provides information on the status or condition of the work space to which it is attached.

"Lower explosive limit (LEL)" means the minimum concentration of vapor in air below which propagation of a flame does not occur in the presence of an ignition source.

"Marine Chemist" means an individual who possesses a current Marine Chemist Certificate issued by the National Fire Protection Association.

"Not Safe for Hot Work" denotes a space where hot work may not be performed because the conditions do not meet the criteria for Safe for Hot Work.

"Nationally Recognized Testing Laboratory (NRTL)" means an organization recognized by OSHA, in accordance with Appendix A of 29 CFR 1910.7, which tests for safety and lists or labels or accepts equipment and materials that meet all the criteria found in 1910.7(b)(1) through (b)(4)(ii).

"Not Safe for Workers" denotes a space where an employee may not enter because the conditions do not meet the criteria for Safe for Workers.

"Oxygen-deficient atmosphere" means an atmosphere having an oxygen concentration of less than 19.5 percent by volume.

"Oxygen-enriched atmosphere" means an atmosphere that contains 22 percent or more oxygen by volume.

"Safe for Hot Work" denotes a space that meets all of the following criteria:

1. The oxygen content of the atmosphere does not exceed 22 percent by volume;
2. The concentration of flammable vapors in the atmosphere is less than 10 percent of the lower explosive limit;
3. The residues or materials in the space are not capable of producing a higher concentration than permitted in paragraph (1) or (2) of the above, under existing atmospheric conditions in the presence of hot work and while maintained as directed by the Marine Chemist or competent person, and
4. All adjacent spaces have been cleaned, or gas-freed, or treated sufficiently to prevent the spread of fire.

"Safe for Workers" denotes a space that meets the following criteria:

1. The oxygen content of the atmosphere is at least 19.5 percent and below 22 percent by volume;
2. The concentration of flammable vapors is below 10 percent of the lower explosive limit (LEL);
3. Any toxic materials in the atmosphere associated with cargo, fuel, tank coatings, or gas-freeing media are within permissible concentrations at the time of the inspection; and
4. Any residues or materials associated with the work authorized by the Marine Chemist, Certified Industrial Hygienist, or competent person will not produce

uncontrolled release of toxic materials under existing atmospheric conditions while maintained as directed.

"Space" means an area on a vessel or vessel section or within a shipyard such as, but not limited to: cargo tanks or holds; pump or engine rooms; storage lockers; tanks containing flammable or combustible liquids, gases, or solids; rooms within buildings; crawl spaces; tunnels; or access ways. The atmosphere within a space is the entire area within its bounds.

"Upper explosive limit (UEL)" means the maximum concentration of flammable vapor in air above which propagation of flame does not occur on contact with a source of ignition.

"Vessel section" means a sub-assembly, module, or other component of a vessel being built, repaired, or broken.

"Visual inspection" means the physical survey of the space, its surroundings and contents to identify hazards such as, but not limited to, restricted accessibility, residues, unguarded machinery, and piping or electrical systems.

8.4 RECORD KEEPING

When tests and inspections are performed by a competent person, Marine Chemist, or Certified Industrial Hygienist as required by any provisions of 29 CFR 1915 subparts B, C, D, or H, American Marine shall ensure that the person performing the test and inspection records the location, time, date, location of inspected spaces, and the operations performed, as well as the test results and any instructions.

American Marine shall maintain either a roster of designated competent persons or a statement that a Marine Chemist will perform the tests or inspections that require a competent person. American Marine shall make the roster of designated persons or the statement available to employees, the employee's representative, or OSHA upon request.

The roster shall contain, as a minimum, the following:

- American Marine’s name, name(s), and
- The date the employee was trained as a competent person.

American Marine shall ensure that the records are posted in the immediate vicinity of the affected operations while work in the spaces is in progress. The records shall be kept on file for a period of at least three months from the completion date of the specific job for which they were generated. American Marine shall ensure that the records are available for inspection by OSHA, and employees and their representatives.

8.5 PRECAUTIONS AND THE ORDER OF TESTING BEFORE ENTERING CONFINED AND ENCLOSED SPACES AND OTHER DANGEROUS ATMOSPHERES

American Marine shall ensure that atmospheric testing is performed in the following sequence: oxygen content, flammability, and toxicity.

8.5.1 Oxygen content

American Marine shall ensure that the following spaces are visually inspected and tested by a competent person to determine the atmosphere's oxygen content prior to initial entry into the space by an employee:

- Spaces that have been sealed, such as, but not limited to, spaces that have been coated and closed up, and non-ventilated spaces that have been freshly painted;
- Spaces and adjacent spaces that contain or have contained combustible or flammable liquids or gases;
- Spaces and adjacent spaces that contain or have contained liquids, gases, or solids that are toxic, corrosive, or irritant;
- Spaces and adjacent spaces that have been fumigated; and
- Spaces containing materials or residues of materials that create an oxygen-deficient atmosphere.

If the space to be entered contains an oxygen deficient atmosphere, the space shall be labeled "Not Safe for Workers" or, if oxygen-enriched, "Not Safe for Workers - Not Safe for Hot Work." If an oxygen-deficient or oxygen-enriched atmosphere is found, ventilation shall be provided at volumes and flow rates sufficient to ensure that the oxygen content is maintained at or above 19.5 percent and below 22 percent by volume. The warning label may be removed when the oxygen content is equal to or greater than 19.5 and less than 22 percent by volume.

An employee may not enter a space where the oxygen content, by volume, is below 19.5 percent or above 22 percent.

Exception: An employee may enter for emergency rescue or for a short duration for installation of ventilation equipment necessary to start work in the space provided:

- The atmosphere in the space is monitored for oxygen content, by volume, continuously; and
- Respiratory protection and other appropriate personal protective equipment and clothing are provided in accordance with the conditions established by this EHS Program.

8.5.2 Flammable atmospheres

American Marine shall ensure that spaces and adjacent spaces that contain or have contained combustible or flammable liquids or gases are:

- Inspected visually by the competent person to determine the presence of combustible or flammable liquids; and
- Tested by a competent person prior to entry by an employee to determine the concentration of flammable vapors and gases within the space.

If the concentration of flammable vapors or gases in the space to be entered is equal to or greater than 10 percent of the lower explosive limit, the space shall be labeled "Not Safe for Workers" and "Not Safe for Hot Work." Ventilation shall be provided at volumes and flow rates sufficient to ensure that the concentration of flammable vapors is maintained below 10

percent of the lower explosive limit. The warning labels may be removed when the concentration of flammable vapors is below 10 percent of the lower explosive limit.

An employee may not enter a space where the concentration of flammable vapors or gases is equal to or greater than 10 percent of the lower explosive limit. Exception: An employee may enter for emergency rescue or for a short duration for installation of ventilation equipment necessary to start work in the space, provided:

- No ignition sources are present;
- The atmosphere in the space is monitored continuously;
- Atmospheres at or above the upper explosive limit are
- maintained; and
- Respiratory protection and other appropriate personal protective equipment and clothing are provided in accordance with Subpart I of 29 CFR 1915.

8.5.3 Toxic, corrosive, irritant or fumigated atmospheres and residues

American Marine shall ensure that spaces or adjacent spaces that contain or have contained liquids, gases, or solids that are toxic, corrosive or irritant are:

- Inspected visually by the competent person to determine the presence of toxic, corrosive, or irritant residue contaminants; and
- Tested by a competent person prior to initial entry by an employee to determine the air concentration of toxics, corrosives, or irritants within the space.

If a space contains an air concentration of a material which exceeds a 29 CFR 1915 Subpart Z permissible exposure limit (PEL) or is immediately dangerous to life or health (IDLH), the space shall be labeled "Not Safe for Workers." Ventilation shall be provided at volumes and flow rates which will ensure that air concentrations are maintained within the PEL or, in the case of contaminants for which there is no established PEL, below the IDLH. The warning label may be removed when the concentration of contaminants is maintained within the PEL or below IDLH level.

If a space cannot be ventilated to within the PELs or is IDLH, a Marine Chemist or CIH must re-test until the space can be certified "Enter with Restrictions" or "Safe for Workers."

An employee may not enter a space whose atmosphere exceeds a PEL or is IDLH. Exception: An employee may enter for emergency rescue, or for a short duration for installation of ventilation equipment provided:

- The atmosphere in the space is monitored continuously; and
- Respiratory protection and other necessary and appropriate personal protective equipment and clothing are provided in accordance with this EHS Program.

8.6 TRAINING OF EMPLOYEES ENTERING CONFINED AND ENCLOSED SPACES DANGEROUS ATMOSPHERES

American Marine shall ensure that each employee that enters a confined or enclosed space and other areas with dangerous atmospheres is trained to perform all required duties safely.

American Marine shall ensure that each employee who enters a confined space, enclosed space, or other areas with dangerous atmospheres is trained to:

- Recognize the characteristics of the confined space;
- Anticipate and be aware of the hazards that may be faced during entry;
- Recognize the adverse health effects that may be caused by the exposure to a hazard;
- Understand the physical signs and reactions related to exposures to such hazards;
- Know what personal protective equipment is needed for safe entry into and exit from the space;
- Use personal protective equipment; and
- Where necessary, be aware of the presence and proper use of barriers that may be needed to protect an entrant from hazards.

American Marine shall ensure that each entrant into confined or enclosed spaces or other dangerous atmospheres is trained to exit the space or dangerous atmosphere whenever:

- American Marine or his or her representative orders evacuation;
- An evacuation signal such as an alarm is activated; or
- The entrant perceives that he or she is in danger.

American Marine shall provide each employee with training:

- Before the entrant begins work addressed by this section; and
- Whenever there is a change in operations or in an employee's duties that presents a hazard about which the employee has not previously been trained.

American Marine shall certify that the training required this section has been accomplished. The certification shall contain the employee's name, the name of the certifier, and the date(s) of the certification. The certification shall be available for inspection by OSHA, employees, and their representatives.

8.7 RESCUE TEAMS

American Marine shall either establish a shipyard rescue team or arrange for an outside rescue team that will respond promptly to a request for rescue service. Shipyard rescue teams shall meet the following criteria:

- Each employee assigned to the shipyard team shall be provided with and trained to use the personal protective equipment he or she will need, including respirators and any rescue equipment necessary for making rescues from confined and enclosed spaces and other dangerous atmospheres.
- Each employee assigned to the shipyard rescue team shall be trained to perform his or her rescue functions including confined and enclosed and other dangerous atmosphere entry.
- Shipyard rescue teams shall practice their skills at least once every 12 months. Practice drills shall include the use of mannequins and rescue equipment during simulated rescue operations involving physical facilities that approximate closely those facilities from which rescue may be needed.

Note: If the team performs an actual rescue during the 12 month period, an additional practice drill for that type of rescue is not required.

At least one person on each rescue team shall maintain current certification in basic first aid, which includes maintenance of an airway, control of bleeding, maintenance of circulation and cardiopulmonary resuscitation (CPR) skills.

American Marine shall inform outside rescue teams of the hazards that the team may encounter when called to perform confined and enclosed space or other dangerous atmosphere rescue at American Marine's facility so that the rescue team can be trained and equipped.

8.8 EXCHANGING HAZARD INFORMATION BETWEEN EMPLOYERS

Each employer whose employees work in confined and enclosed spaces or other dangerous atmospheres shall ensure that all available information on the hazards, safety rules, and emergency procedures concerning those spaces and atmospheres is exchanged with any other employer whose employees may enter the same spaces.

8.9 CLEANING AND OTHER COLD WORK

8.9.1 Locations covered by this section

American Marine shall ensure that manual cleaning and other cold work are not performed in the following spaces unless the conditions of this section have been met:

- Spaces containing or having last contained bulk quantities of combustible or flammable liquids or gases; and
- Spaces containing or having last contained bulk quantities of liquids, gases or solids that are toxic, corrosive or irritating.

8.9.2 Requirements for performing cleaning or cold work

Liquid residues of hazardous materials shall be removed from work spaces as thoroughly as practicable before employees start cleaning operations or cold work in a space. Special care shall be taken to prevent the spilling or the draining of these materials into the water surrounding the vessel, or for shore-side operations, onto the surrounding work area.
Testing shall be conducted by a competent person to determine the concentration of flammable, combustible, toxic, corrosive, or irritant vapors within the space prior to the beginning of cleaning or cold work. Continuous ventilation shall be provided at volumes and flow rates sufficient to ensure that the concentration(s) of:

- Flammable vapor is maintained below 10 percent of the lower explosive limit; and
- Toxic, corrosive, or irritant vapors are maintained within the permissible exposure limits and below IDLH levels.

Note: Spaces containing highly volatile residues may require additional ventilation to keep the concentration of flammable vapors below 10 percent of the lower explosive limit and within the permissible exposure limit.

Testing shall be conducted by the competent person as often as necessary during cleaning or cold work to assure that air concentrations are below 10 percent of the lower explosive limit and within the PELs and below IDLH levels. Factors such as, but not limited to, temperature,

volatility of the residues and other existing conditions in and about the spaces are to be considered in determining the frequency of testing necessary to assure a safe atmosphere.

Spills or other releases of flammable, combustible, toxic, corrosive, and irritant materials shall be cleaned up as work progresses.

An employee may not enter a confined or enclosed space or other dangerous atmosphere if the concentration of flammable or combustible vapors in work spaces exceeds 10 percent of the lower explosive limit.

Exception: An employee may enter for emergency rescue or for a short duration for installation of ventilation equipment provided:

- No ignition sources are present;
- The atmosphere in the space is monitored continuously;
- The atmosphere in the space is maintained above the upper explosive limit; and
- Respiratory protection, personal protective equipment, and clothing are provided in accordance with the requirements of the American Marine's program.

A competent person shall test ventilation discharge areas and other areas where discharged vapors may collect to determine if vapors discharged from the spaces being ventilated are accumulating in concentrations hazardous to employees. If the tests indicate that concentrations of exhaust vapors that are hazardous to employees are accumulating, all work in the contaminated area shall be stopped until the vapors have dissipated or been removed.

Only explosion-proof, self-contained portable lamps, or other electric equipment approved by a National Recognized Testing Laboratory (NRTL) for the hazardous location shall be used in spaces described in paragraph (a) of this section until such spaces have been certified as "Safe for Workers."

Note: Battery-fed, portable lamps or other electric equipment bearing the approval of a NRTL for the class, and division of the location in which they are used are deemed to meet the requirements of this section.

American Marine shall prominently post signs that prohibit sources of ignition within or near a space that has contained flammable or combustible liquids or gases in bulk quantities:

- At the entrance to those spaces;
- In adjacent spaces; and
- In the open area adjacent to those spaces.

All air moving equipment and its component parts, including duct work, capable of generating a static electric discharge of sufficient energy to create a source of ignition, shall be bonded electrically to the structure of a vessel or vessel section or, in the case of land-side spaces, grounded to prevent an electric discharge in the space. Fans shall have non-sparking blades, and portable air ducts shall be of non-sparking materials.

8.10 HOT WORK

8.10.1 Hot work requiring testing by a Marine Chemist or Coast Guard authorized person

American Marine shall ensure that hot work is not performed in or on any of the following confined and enclosed spaces and other dangerous atmospheres, boundaries of spaces or pipelines until the work area has been tested and certified by a Marine Chemist or a U.S. Coast Guard authorized person as "Safe for Hot Work":

- Within, on, or immediately adjacent to spaces that contain or have contained combustible or flammable liquids or gases.
- Within, on, or immediately adjacent to fuel tanks that contain or have last contained fuel; and
- On pipelines, heating coils, pump fittings or other accessories connected to spaces that contain or have last contained fuel.

Exception: On dry cargo, miscellaneous and passenger vessels and in the landside operations within spaces which meet the standards for oxygen, flammability and toxicity in 29 CFR 1915.12, but are adjacent to spaces containing flammable gases or liquids, as long as the gases or liquids have a flash point below 150° F (65.6° C) and the distance between such spaces and the work is 25 feet (7.5 m) or greater.

The certificate issued by the Marine Chemist or Coast Guard authorized person shall be posted in the immediate vicinity of the affected operations while they are in progress and kept on file for a period of at least three months from the date of the completion of the operation for which the certificate was generated.

8.10.2 Hot work requiring testing by a competent person

Hot work is not permitted in or on the following spaces or adjacent spaces or other dangerous atmospheres until they have been tested by a competent person and determined to contain no concentrations of flammable vapors equal to or greater than 10 percent of the lower explosive limit:

- Dry cargo holds,
- The bilges,
- The engine room and boiler spaces for which a Marine Chemist or a Coast Guard authorized person certificate is not required;
- Vessels and vessel sections for which a Marine Chemist or Coast Guard authorized person certificate is not required ; and
- Land-side confined and enclosed spaces or other dangerous atmospheres.

If the concentration of flammable vapors or gases is equal to or greater than 10 percent of the lower explosive limit in the space or an adjacent space where the hot work is to be done, then the space shall be labeled "Not Safe for Hot Work" and ventilation shall be provided at volumes and flow rates sufficient to ensure that the concentration off flammable vapors or gases is below 10 percent by volume of the lower explosive limit. The warning label may be removed when the concentration of flammable vapors and gases are below 10 percent lower explosive limit.

8.11 MAINTENANCE OF SAFE CONDITIONS

8.11.1 Preventing hazardous materials from entering

Pipelines that could carry hazardous materials into spaces that have been certified "Safe for Workers" or "Safe for Hot Work" shall be disconnected, blanked off, or otherwise blocked by a positive method to prevent hazardous materials from being discharged into the space.

8.11.2 Alteration of existing conditions

When a change that could alter conditions within a tested confined or enclosed space or other dangerous atmosphere occurs, work in the affected space or area shall be stopped. Work may not be resumed until the affected space or area is visually inspected and retested and found to comply with 29 CFR 1915.12, 1915.13, and 1915.14, as applicable.

Note: Examples of changes that would warrant the stoppage of work include: The opening of manholes or other closures or the adjusting of a valve regulating the flow of hazardous materials.

8.11.3 Tests to maintain the conditions of a Marine Chemist's or Coast Guard authorized person's certificates

A competent person shall visually inspect and test each space certified as "Safe for Workers" or "Safe for Hot Work," as often as necessary to ensure that atmospheric conditions within that space is maintained within the conditions established by the certificate after the certificate has been issued.

8.11.4 Change in the conditions of a Marine Chemist's or Coast Guard authorized person's certificate

If a competent person finds that the atmospheric conditions within a certified space fail to meet the applicable requirements of 1915.12, 1915.13, and 1915.14 of this part, work in the certified space shall be stopped and may not be resumed until the space has been retested by a Marine Chemist or Coast Guard authorized person and a new certificate issued in accordance with 29 CFR 1915.14(a).

8.11.5 Tests to maintain a competent person's findings

After a competent person has conducted a visual inspection and tests required in 29 CFR 1915.12, 1915.13, and 1915.14 and determined a space to be safe for an employee to enter, he or she shall continue to test and visually inspect spaces as often as necessary to ensure that the required atmospheric conditions within the tested space are maintained.

8.11.6 Changes in conditions determined by competent person's findings

After the competent person has determined initially that a space is safe for an employee to enter and he or she finds subsequently that the conditions within the tested space fail to meet the requirements of 29 CFR 1915.12, 1915.13, and 1915.14, as applicable, work shall be stopped until the conditions in the tested space are corrected to comply with 29 CFR 1915.12, 1915.13, and 1915.14, as applicable.

8.12 WARNING SIGNS AND LABELS.

8.12.1 Employee comprehension of signs and labels

American Marine shall ensure that each sign or label posted to comply with the requirements of this subpart is presented in a manner that can be perceived and understood by all employees.

8.12.2 Posting of large work areas

A warning sign or label required by paragraph (a) of this section need not be posted at an individual tank, compartment or work space within a work area if the entire work area has been tested and certified: not safe for workers, not safe for hot work, and if the sign or label to this effect is posted conspicuously at each means of access to the work area.

8.13 COMPLIANCE ASSISTANCE GUIDELINES FOR CONFINED AND ENCLOSED SPACES AND OTHER DANGEROUS ATMOSPHERES

This set of guidelines is provided to assist American Marine in complying with the requirements of this Program. This guideline neither creates additional obligations nor detracts from obligations otherwise contained in the program. It is intended to provide explanatory information and educational material to American Marine and its employees to foster understanding of, and compliance with, the standard.

Definition of "Hot work." There are several instances in which circumstances do not necessitate that grinding, drilling, abrasive blasting be regarded as hot work. Some examples are:

1. Abrasive blasting of the hull for paint preparation does not necessitate pumping and cleaning the tanks of a vessel.
2. Prior to hot work on any hollow structure, the void space should be tested and appropriate precautions taken.

Definition of "Lower explosive limit." The terms lower flammable limit (LFL) and lower explosive limit (LEL) are used interchangeably in fire science literature.

Definition of "Upper explosive limit." The terms upper flammable limit (UFL) and upper explosive limit (UEL) are used interchangeably in fire science literature.

8.13.1 Oxygen

After a tank has been properly washed and ventilated, the tank should contain 20.8 percent oxygen by volume. This is the same amount found in our normal atmosphere at sea level. However, it is possible that the oxygen content will be lower. When this is the case, the reasons for this deficiency should be determined and corrective action taken. An oxygen content of 19.5 percent can support life and is adequate for entry. However, any oxygen level less than 20.8 percent and greater than 19.5 percent level should also alert the competent person to look for the causes of the oxygen deficiency and to correct them prior to entry.

8.13.2 Flammable atmospheres

Atmospheres with a concentration of flammable vapors at or above 10 percent of the lower explosive limit (LEL) are considered hazardous when located in confined spaces. However, atmospheres with flammable vapors below 10 percent of the LEL are not necessarily safe. Such atmospheres are too lean to burn. Nevertheless, when a space contains or produces measurable flammable vapors below the 10 percent LEL, it might indicate that flammable vapors are being released or introduced
into the space and could present a hazard in time. Therefore, the cause of the vapors should be investigated and, if possible, eliminated prior to entry. Some situations that have produced measurable concentrations of flammable vapors that could exceed 10 percent of the LEL in time are:

1. Pipelines that should have been blanked or disconnected have opened, allowing product into the space.
2. The vessel may have shifted, allowing product not previously cleaned and removed during washing to move into other areas of the vessel.
3. Residues may be producing the atmosphere by releasing flammable vapor.

8.13.3 Flammable atmospheres that are toxic

An atmosphere with a measurable concentration of a flammable substance below 10 percent of the LEL may be above the OSHA permissible exposure limit for that substance. In that case, refer to 29 CFR 1915.12(c) (2), (3), and (4).

The frequency with which a tank is monitored to determine if atmospheric conditions are being maintained is a function of several factors that are discussed below:

1. Temperature. Higher temperatures will cause a combustible or flammable liquid to vaporize at a faster rate than lower temperatures. This is important since hotter days may cause tank residues to produce more vapors and that may result in the vapors exceeding 10 percent of the LEL or an overexposure to toxic contaminants.
2. Work in the tank. Any activity in the tank could change the atmospheric conditions in that tank. Oxygen from a leaking oxy-fuel hose or torch could result in an oxygen-enriched atmosphere that would more easily propagate a flame. Some welding operations use inert gas, and leaks can result in an oxygen-deficient atmosphere. Manual tank cleaning with high pressure spray devices can stir up residues and result in exposures to toxic contaminants. Simple cleaning or mucking out, where employees walk through and shovel residues and sludge, can create a change in atmospheric conditions.
3. Period of time elapsed. If a period of time has elapsed since a Marine Chemist or Coast Guard authorized person has certified a tank as safe, the atmospheric condition should be rechecked by the competent person prior to entry and starting work.
4. Unattended tanks or spaces. When a tank or space has been tested and declared safe, then subsequently left unattended for a period of time, it should be retested prior to entry and starting work. For example, when barges are left unattended at night, unidentified products from another barge are sometimes dumped into their empty tanks. Since this would result in a changed atmosphere, the tanks should be retested prior to entry and starting work.
5. Work break. When workers take a break or leave at the end of the shift, equipment sometimes is inadvertently left in the tanks. At lunch or work breaks and at the end of the shift are the times when it is most likely someone will leave a burning or cutting torch in the tank, perhaps turned on and leaking oxygen or an inert gas. Since the former can produce an oxygen-enriched atmosphere, and the latter an oxygen-deficient atmosphere, tanks should be checked for equipment left behind, and atmosphere, monitored if necessary prior to re-entering and resuming work. In an oxygen-enriched atmosphere, the flammable range is severely broadened. This means that an oxygen-enriched atmosphere can promote very rapid burning.
6. Ballasting or trimming. Changing the position of the ballast, or trimming or in any way moving the vessel so as to expose cargo that had been previously trapped, can produce a change in the atmosphere of the tank. The atmosphere should be retested after any such move and prior to entry or work.

8.13.4 Hot work

This is a reminder that other sections of the OSHA shipyard safety and health standards in part 1915 should be reviewed prior to starting any hot work. Most notably, Subpart D, Welding, Cutting and Heating, places additional restrictions on hot work: The requirements of 1915.51 and 1915.53 must be met before hot work is begun on any metal that is toxic or is covered by a preservative coating respectively; the requirements of 1915.54 must be met before welding, cutting, or heating is begun on any structural voids. During hot work, more than 20.8 percent oxygen by volume can be unsafe since it extends the normal flammable range. The standard permits the oxygen level to reach 22 percent by volume in order to account for instrument error. However, the cause of excess oxygen should be investigated and the source removed.

9. Emergency Procedures

EMPLOYEE

- Contact your supervisor immediately in the event of an emergency.
- Know the location of the nearest hospital to the site.
- Know how to contact the fire department in case of a fire emergency.
- Know the procedures to follow in case of a fire, medical, or severe weather emergency.
- Know the location of the first aid kit.

EMPLOYER

- Train employees on proper emergency procedures.
- Know the location of the nearest hospital to the site.
- Know how to contact the fire department in case of a fire emergency.
- Know the procedures to follow in case of a fire, medical, or severe weather emergency.
- Know the location of the first aid kit.

9.1 MEDICAL/INJURY

In the event of a medical emergency, the injury should be assessed to determine its severity. If the injured employee is able, he/she should proceed to the nearest hospital, listed below:

Sentara Norfolk General Hospital, 600 Gresham Drive, Norfolk (757-668-3000)

Proceed out of the shipyard and take a left at the light next to Hardees (Filmore Street) onto Campostella Road and up onto the bridge. Continue straight through town passing Scope and going over the little bridge next to NOAA and PETA (The Hague). Go through the light at Brambleton and Colley, take the next right into the hospital entrance marked Emergency Entrance. Total trip is about 7 minutes. Distance is about 3.5 miles. A route map is provided as figure 1.

If the employee is not able to proceed to the hospital him/herself, the local emergency response team should be notified immediately by dialing 911. Be prepared to give the operator the address of the site, the location of the injured worker on the site, and the nature of his/her injury. One employee should proceed to the entrance to the site in order to direct the emergency workers to the injured person.

The employee(s) trained in first aid are:

Russ Francis
Steve McGee
Tim Mullane
Patrick Pawliczek
Steve Thornton

One or more of these employees should be notified immediately in case of an emergency and directed to the location of the injured worker.

9.2 FIRST AID TRAINING

The employees designated as being trained in first aid for the site should have the following training:

- CPR
- Bloodborne Pathogens
- Use of PPE while rendering first-aid

Unless a first aid room and a qualified attendant are close at hand and prepared to render first aid to employees on behalf of the employer, the employer shall furnish a first aid kit for each vessel on which work is being performed, except that when work is being performed on more than one small vessel at one pier, only one kit shall be required. The kit, when required, shall be kept close to the vessel and at least one employee, close at hand, shall be qualified to administer first aid to the injured. The first aid kit shall consist of a weatherproof container with individual sealed packages for each type of item. The contents of such kit shall contain a sufficient quantity of at least the following types of items:

- Gauze roller bandages, 1 inch and 2 inch.
- Gauze compress bandages, 4 inch.
- Adhesive bandages, 1 inch.
- Triangular bandage, 40 inch.
- Ammonia inhalants and ampules.
- Antiseptic applicators or swabs.
- Burn dressing.
- Eye dressing.
- Wire or thin board splints.
- Forceps and tourniquet.

The contents of the first aid kit shall be checked before being sent out on each job and at least weekly on each job to ensure that the expended items are replaced.

There shall be available for each vessel on which ten (10) or more employees are working one Stokes basket stretcher, or equivalent, permanently equipped with bridles for attaching to the hoisting gear, except that no more than two stretchers are required on each job location. A blanket or other liner suitable for transferring the patient to and from the stretcher shall be provided. Stretchers shall be kept close to the vessels. This does not apply where ambulance services which are available are known to carry such stretchers.

9.3 FIRE

The local fire department may be reached by dialing 911. In the event of a fire emergency, be prepared to tell the operator the site address, the location of the fire on the site, and the nature of the event which started the fire (i.e., electrical short, gas line leak, etc.), if known. Designate one employee to proceed to the entrance to the yard in order to direct the fire fighters to the location of the fire.

9.4 BLOODBORNE PATHOGENS

Workers who may be required to administer first aid to others will be trained in procedures to avoid contact with any bloodborne pathogens, in accordance with 29 CFR 1910.1030.

9.5 SEVERE WEATHER

Severe weather is a very realistic hazard on the Atlantic Coast. To prepare for any potential severe weather situations, the following procedures have been developed. These procedures are to be implemented in the event of a severe weather watch or warning.

9.5.1 Hurricane/Tornado

- All portable buildings will be anchored to the ground.
- Other structures such as box vans will be anchored or moved to a safer area.
- If at all possible, light scrap will be shipped out prior to the severe weather event. If this is not possible, heavier pieces of iron will be used to cover the scrap.
- Objects capable of becoming airborne will be secured.
- Cranes will be boomed down and secured.
- Hoses and tools will be picked up and secured.
- Vessels in the slip shall be reinspected and secured with extra line using pieces of equipment as extra anchors.
- Oxygen and gas will be turned off at the main connection
- Power to the vessel will be shut down.
- After everything has been secured, the facility will be evacuated.

9.5.2 Lightning

- Workers on the vessel and in the yard will stop work and stand by under cover.
- All power to the vessel will be shut down.
- Oxygen and gas will be turned off at the main connection.
- Cranes shall be boomed down.
- All personnel will seek shelter.

10. Housekeeping

EMPLOYEES

- Keep working surfaces on and around the vessel reasonably free of materials.
- Do not eat or change in areas where hazardous material removal is taking place.
- Eat, smoke, change clothing, and apply cosmetics only in designated areas.

EMPLOYER

- Provide the required facilities for proper sanitary conditions on site.
- Ensure that employees clean up their work areas properly.

10.1 HOUSEKEEPING IN WORK AREAS

Good housekeeping conditions shall be maintained at all times. Adequate aisles and passageways shall be maintained in all work areas. All staging platforms, ramps, stairways, walkways, aisles, and passageways on vessels or dry docks shall be kept clear of all tools, materials, and equipment except that which is in use, and all debris such as welding rod tips, bolts, nuts, and similar material. Hose and electric conductors shall be elevated over or placed under the walkway or working surfaces or covered by adequate crossover planks.

All working areas on or immediately surrounding vessels and dry docks, graving docks, or marine railways shall be kept reasonably free of debris, and construction material shall be so piled as not to present a hazard to employees. Slippery conditions on walkways or working surfaces shall be eliminated as they occur. Free access shall be maintained at all times to all exits and to all fire-alarm boxes or fire-extinguishing equipment. All oils, paints thinners, solvents, waste, rags, or other flammable substances shall be kept in fire resistant covered containers when not in use.

Where dust routinely accumulates, all surfaces will be maintained as free as practical of such accumulation. Surfaces will be cleaned at least once per shift to prevent accumulation of lead dust or more frequently, if necessary. All cleaning will use methods, such as vacuuming with HEPA filtered vacuum cleaners or washing down, where feasible, observing water pollution regulations as they pertain to contaminated waste water. Wet sweeping, shoveling, or brushing will be used when other methods have been tried and found to be ineffective or unfeasible. Compressed air will NOT be used to clean work surfaces or floors.

10.2 PROTECTIVE CLOTHING

If an employee is exposed to a hazardous material above the PEL, without regard to the use of respirators or where the possibility of skin or eye irritation exists, American Marine shall provide at no cost to the employee and assure that the employee uses appropriate protective work clothing and equipment. The protective clothing shall be provided in a clean and dry condition at least weekly. American Marine shall provide for the cleaning, laundering, or disposal of protective clothing and equipment required. American Marine shall repair or replace required protective clothing and equipment as needed to maintain their effectiveness and shall assure that all protective clothing is removed at the completion of a work shift only in change rooms provided for that purpose as prescribed.

Contaminated protective clothing that is to be cleaned, laundered, or disposed of, will be placed in a closed container in the change-room, which prevents dispersion of lead outside the container. American Marine shall inform in writing any person who cleans or launders protective clothing or equipment of the potentially harmful effects of exposure to the hazardous material involved. The containers of contaminated protective clothing and equipment will be labeled as follows: CAUTION: CLOTHING CONTAMINATED WITH [hazardous substance]. DO NOT REMOVE DUST BY BLOWING OR SHAKING. DISPOSE OF [hazardous substance] CONTAMINATED WASH WATER IN ACCORDANCE WITH APPLICABLE LOCAL, STATE, OR FEDERAL REGULATIONS.

The removal of hazardous substances from protective clothing or equipment by blowing, shaking, or any other means which disperses the hazardous substance into the air is prohibited.

10.3 HYGIENE FACILITIES AND PRACTICES

American Marine shall assure that in areas where employees are exposed to lead above the PEL, without regard to the use of respirators, food or beverage is not present or consumed, tobacco products are not present or used, and cosmetics are not applied, except in change rooms, lunchrooms, and showers required under this section.

10.4 CHANGE ROOMS

American Marine shall provide clean change rooms for employees who work in areas where their airborne exposure to lead is above the PEL, without regard to the use of respirators. Change rooms will be equipped with separate storage facilities for protective work clothing and equipment and for street clothes that prevent cross-contamination.

10.5 SHOWERS

American Marine shall assure that employees who work in areas where their airborne exposure to a hazardous substance is above the PEL, without regard to the use of respirators, shower at the end of the work shift. Employees who are required to shower will not leave the workplace wearing any clothing or equipment worn during the work shift.

10.6 LUNCHROOMS

American Marine shall provide lunchroom facilities for employees who work in areas where their airborne exposure to a hazardous substance is above the PEL, without regard to the use of respirators. Lunchroom facilities will have a temperature controlled, positive pressure, filtered air supply, and are readily accessible to employees. Employees who work in areas where their airborne exposure to a hazardous substance is above the PEL without regard to the use of a respirator will wash their hands and face prior to eating, drinking, smoking or applying cosmetics. Employees will not enter lunchroom facilities with protective work clothing or equipment unless surface lead dust has been removed by vacuuming, down draft booth, or other cleaning method.

10.7 LAVATORIES

American Marine shall provide an adequate number of lavatory facilities that comply with 29 CFR 1910.141(d)(1) and (2).

11. Walking/Working Surfaces

EMPLOYEES

- Do not work on an elevated surface that is not properly guarded.
- If a backrail is not provided on a working surface that is elevated 5 feet or more, safety belts and lifelines must be worn.
- Report any situations that appear potentially hazardous to your supervisor immediately.

EMPLOYER

- Ensure that all working surfaces are kept properly cleared and that employees take the proper precautions to protect their safety.

11.1 SCAFFOLDS OR STAGING

11.1.1 General requirements

All scaffolds and their supports whether of lumber, steel or other material, shall be capable of supporting the load they are designed to carry with a safety factor of not less than four (4). All lumber used in the construction of scaffolds shall be spruce, fir, long leaf yellow pine, Oregon pine or wood of equal strength. The use of hemlock, short leaf yellow pine, or short fiber lumber is prohibited. Lumber dimensions as given in this subpart are nominal except where given in fractions of an inch. All lumber used in the construction of scaffolds shall be sound, straight-grained, free from cross grain, shakes and large, loose or dead knots. It shall also be free from dry rot, large checks, wormholes or other defects that impair its strength or durability. Scaffolds shall be maintained in a safe and secure condition. Any component of the scaffold that is broken, burned or otherwise defective shall be replaced. Barrels, boxes, cans, loose bricks, or other unstable objects shall not be used as working platforms or for the support of planking intended as scaffolds or working platforms. No scaffold shall be erected, moved, dismantled or altered except under the supervision of competent persons.

11.1.2 Horse scaffolds

The minimum dimensions of lumber used in the construction of horses shall be in accordance with Table E-3 (also in 29 CFR 1915.118). Horses constructed of materials other than lumber shall provide the strength, rigidity and security required of horses constructed of lumber. The lateral spread of the legs shall be equal to not less than one-third of the height of the horse. All horses shall be kept in good repair, and shall be properly secured when used in staging or in locations where they may be insecure. Platform planking shall be in accordance with the requirements of this section. Backrails and toeboards shall be in accordance with this section.

Table E-3 - Specifications for the Construction of Horses

	Height in feet		
Structural members	Up to 10	10 to 16	16 to 20
	(inches)		
Legs	2 x 4	3 x 4	4 x 6
Bearers or headers	2 x 6	2 x 8	4 x 6

Crossbraces	2 x 4 or 1 x 8	2 x 4	2 x 6
Longitudinal braces	2 x 4	2 x 6	2 x 6

11.1.3 Other types of scaffolds

Scaffolds of a type for which specifications are not contained in this section shall meet the general requirements of this section shall be in accordance with recognized principles of design and shall be constructed in accordance with accepted standards covering such equipment.

11.1.4 Scaffold or platform planking

Except as otherwise provided in this section, platform planking shall be of not less than 2 x 10-inch lumber. Platform planking shall be straight-grained and free from large or loose knots and may be either rough or dressed. Platforms of staging shall be not less than two 10 inch planks in width except in such cases as the structure of the vessel or the width of the trestle ladders make it impossible to provide such a width. Platform planking shall project beyond the supporting members at either end by at least 6 inches but in no case shall project more than 12 inches unless the planks are fastened to the supporting members. Table E-4 below (and in 1915.118) shall be used as a guide in determining safe loads for scaffold planks.

Table E-4 - Safe Center Loads for Scaffold Plank of 1,100 Pounds Fiber Stress

Span in feet	Lumber dimensions in inches									
	A	B	A	B	A	B	A	B	A	B
	2x10	1 5/8 x 9 1/2	2x12	1 5/8 x 11 1/2	3 x 8	2 5/8 x 7 1/2	3x10	2 5/8 x 9 1/2	3x12	2 5/8 x 11 1/2
6	256		309		526		667		807	
8	192		232		395		500		605	
10	153		186		316		400		484	
12	128		155		263		333		404	
14	110		133		225		286		346	
16			116		197		250		303	

(A): Rough lumber.
(B): Dressed lumber.

11.1.5 Backrails and toeboards

Scaffolding, staging, runways, or working platforms which are supported or suspended more than 5 feet above a solid surface, or at any distance above the water, shall be provided with a railing which has a top rail whose upper surface is from 42 to 45 inches above the upper surface of the staging, platform, or runway and a midrail located halfway between the upper rail and the staging, platform, or runway. Rails shall be of 2 x 4 inch lumber, flat bar or pipe. When used with rigid supports, taut wire or fiber rope of adequate strength may be used. If the distance between supports is more than 8 feet, rails shall be equivalent in strength to 2 x 4 inch lumber. Rails shall be firmly secured. Where exposed to hot work or chemicals, fiber rope rails shall not be used. Rails may be omitted where the structure of the vessel prevents their use. When rails are omitted, employees working more than 5 feet above solid surfaces shall be protected by safety belts and life lines meeting the requirements of 29 CFR

1915.154(b), and employees working over water shall be protected by buoyant work vests meeting the requirements of 29 CFR 1915.154(a). Employees working from swinging scaffolds which are triced out of a vertical line below their supports or from scaffolds on paint floats subject to surging, shall be protected against falling toward the vessel by a railing or a safety belt and line attached to the backrail. When necessary, to prevent tools and materials from falling on men below, toeboards of not less than 1 x 4 inch lumber shall be provided.

11.1.6 Access to staging

Access from below to staging more than 5 feet above a floor, deck or the ground shall consist of well secured stairways, cleated ramps, fixed or portable ladders meeting the applicable requirements of section 14.2 or rigid type non-collapsible trestles with parallel and level rungs. Ramps and stairways shall be provided with 36-inch handrails with midrails. Ladders shall be so located or other means shall be taken so that it is not necessary for employees to step more than one foot from the ladder to any intermediate landing or platform. Ladders forming integral parts of prefabricated staging are deemed to meet the requirements of these regulations. Access from above to staging more than 3 feet below the point of access shall consist of a straight, portable ladder meeting the applicable requirements of section 14.2 or a Jacob's ladder properly secured, meeting the requirements of section 14.4.

11.2 LADDERS

11.2.1 General requirements

The use of ladders with broken or missing rungs or steps, broken or split side rails, or other faulty or defective construction is prohibited. When ladders with such defects are discovered, they shall be immediately withdrawn from service. Inspection of metal ladders shall include checking for corrosion of interiors of open end, hollow rungs. When sections of ladders are spliced, the ends shall be abutted, and not fewer than 2 cleats shall be securely nailed or bolted to each rail. The combined cross sectional area of the cleats shall be not less than the cross sectional area of the side rail. The dimensions of side rails for their total length shall be those specified in this section. Portable ladders shall be lashed, blocked or otherwise secured to prevent their being displaced. The side rails of ladders used for access to any level shall extend not less than 36 inches above that level. When this is not practical, grab rails which will provide a secure grip for an employee moving to or from the point of access shall be installed. Portable metal ladders shall be of strength equivalent to that of wood ladders. Manufactured portable metal ladders provided by the employer shall be in accordance with the provisions of the American National Standards Institute Safety Code for Portable Metal Ladders, A14.2-1972. Portable metal ladders shall not be used near electrical conductors or for electric arc welding operations. Manufactured portable wood ladders provided by the employer shall be in accordance with the provisions of the American National Standards Institute Safety Code for Portable Wood Ladders, A14-1975. Construction of portable wood cleated ladders up to 30 feet in length. Wood side rails shall be made from West Coast hemlock, Eastern spruce, Sitka spruce, or wood of equivalent strength. Material shall be seasoned, straight-grained wood, and free from shakes, checks, decay or other defects which will impair its strength. The use of low-density woods is prohibited. Side rails shall be dressed on all sides and kept free of splinters. All knots shall be sound and hard. The use of material containing loose knots is prohibited. Knots shall not appear on the narrow face of the rail and, when in the side face, shall be not more than 1/2 inch in diameter or within 1/2 inch of the edge of the rail or nearer than 3 inches to a tread or rung. Pitch pockets not exceeding 1/8 inch in width, 2 inches in length and 1/2 inch in depth are permissible in wood side rails, provided that not more than one such pocket appears in each 4 feet of length. The width

between side rails at the base shall be not less than 11 1/2 inches for ladders 10 feet or less in length. For longer ladders this width shall be increased at least 1/4 inch for each additional 2 feet in length. Side rails shall be at least 1 5/8 x 3 5/8 inches in cross section. Cleats (meaning rungs rectangular in cross section with the wide dimension parallel to the rails) shall be of the material used for side rails, straight-grained and free from knots. Cleats shall be mortised into the edges of the side rails 1/2 inch, or filler blocks shall be used on the rails between the cleats. The cleats shall be secured to each rail with three 10d common wire nails or fastened with through bolts or other fasteners of equivalent strength. Cleats shall be uniformly spaced not more than 12 inches apart. Cleats 20 inches or less in length shall be at least 25/32 x 3 inches in cross section. Cleats over 20 inches but not more than 30 inches in length shall be at least 25/32 x 3 3/4 inches in cross section. Construction of portable wood cleated ladders from 30 to 60 feet in length. Ladders from 30 to 60 feet in length shall be in accordance with the specifications of this section with the following exceptions:

- Rails shall be of not less than 2 x 6 inch lumber.
- Cleats shall be of not less than 1 x 4 inch lumber.
- Cleats shall be nailed to each rail with five 10d common wire nails or fastened with through bolts or other fastenings of equivalent strength.

11.3 ACCESS TO VESSELS.

11.3.1 Access to vessels afloat

The employer shall not permit employees to board or leave any vessel, except a barge or river towboat, until the following requirements have been met:

- Whenever practicable, a gangway of not less than 20 inches walking surface of adequate strength, maintained in safe repair and safely secured shall be used. If a gangway is not practicable, a substantial straight ladder, extending at least 36 inches above the upper landing surface and adequately secured against shifting or slipping shall be provided. When conditions are such that neither a gangway nor a straight ladder can be used, a Jacob's ladder meeting the requirements of paragraphs (d)(1) and (2) of this section may be used.
- Each side of such gangway, and the turn table if used, shall have a railing with a minimum height of approximately 33 inches measured perpendicularly from rail to walking surface at the stanchion, with a mid rail. Rails shall be of wood, pipe, chain, wire or rope and shall be kept taut at all times.
- Gangways on vessels inspected and certificated by the U.S. Coast Guard are deemed to meet the foregoing requirements, except in cases where the vessel's regular gangway is not being used.
- The gangway shall be kept properly trimmed at all times.
- When a fixed tread accommodations ladder is used, and the angle is low enough to require employees to walk on the edge of the treads, cleated duckboards shall be laid over and secured to the ladder.
- When the lower end of a gangway overhangs the water between the ship and the dock in such a manner that there is danger of employees falling between the ship and the dock, a net or other suitable protection shall be rigged at the foot of the gangway in such a manner as to prevent employees from falling from the end of the gangway.
- If the foot of the gangway is more than one foot away from the edge of the apron, the space between them shall be bridged by a firm walkway equipped with railings, with a minimum height of approximately 33 inches with midrails on both sides.
- Supporting bridles shall be kept clear so as to permit unobstructed passage for employees using the gangway.

- When the upper end of the means of access rests on or flush with the top of the bulwark, substantial steps properly secured and equipped with at least one substantial handrail approximately 33 inches in height shall be provided between the top of the bulwark and the deck.
- Obstructions shall not be laid on or across the gangway.
- The means of access shall be adequately illuminated for its full length.
- Unless the construction of the vessel makes it impossible, the means of access shall be so located that drafts of cargo do not pass over it. In any event, loads shall not be passed over the means of access while employees are on it.
-

11.3.2 Access to vessels in dry-dock or between vessels

Gangways meeting the requirements of this section shall be provided for access from wingwall to vessel or, when two or more vessels, other than barges or river towboats, are lying abreast, from one vessel to another.

11.3.3 Access to barges and river towboats

Ramps for access of vehicles to or between barges shall be of adequate strength, provided with sideboards, well maintained and properly secured. Unless employees can step safely to or from the wharf, float, barge, or river towboat, either a ramp in accordance with the requirements of this section shall be provided. When a walkway is impracticable, a substantial straight ladder, extending at least 36 inches above the upper landing surface and adequately secured against shifting or slipping, shall be provided. When conditions are such that neither a walkway nor a straight ladder can be used, a Jacob's ladder in accordance with the requirements of this section may be used. The means of access shall be in accordance with the requirements of this section.

11.3.4 Jacob’s ladders

Jacob's ladders shall be of the double rung or flat tread type. They shall be well maintained and properly secured. A Jacob's ladder shall either hang without slack from its lashings or be pulled up entirely.

11.4 ACCESS TO AND GUARDING OF DRY DOCKS AND MARINE RAILWAYS.

A gangway, ramp or permanent stairway of not less than 20 inches walking surface, of adequate strength, maintained in safe repair and securely fastened, shall be provided between a floating dry dock and the pier or bulkhead. Each side of such gangway, ramp or permanent stairway, including those which are used for access to wing walls from dry dock floors, shall have a railing with a mid rail. Such railings on gangways or ramps shall be approximately 42 inches in height; and railings on permanent stairways shall be not less than approximately 30 or more than approximately 34 inches in height. Rails shall be of wood, pipe, chain, wire, or rope, and shall be kept taut at all times. Railings meeting the requirements of this section shall be provided on the means of access to and from the floors of graving docks. Railings approximately 42 inches in height, with a mid rail, shall be provided on the edges of wing walls of floating dry docks and on edges of graving docks. Sections of the railings may be temporarily removed where necessary to permit line handling while a vessel is entering or leaving the dock. When employees are working on the floor of a floating dry dock where they are exposed to the hazard of falling into the water, the end of the dry dock shall be equipped with portable stanchions and 42 inch railings with a mid rail. When such a railing would be impracticable or ineffective, other effective means shall be provided to prevent men from falling into the water. Access to wing walls from floors of dry docks shall be by ramps, permanent stairways or ladders meeting the applicable requirements of 29 CFR 1915.72.

Catwalks on stiles of marine railways shall be no less than 20 inches wide and shall have on at least one side a guardrail and midrail meeting the requirements of 1915.71(j)(1) and (2).

11.5 ACCESS TO CARGO SPACES AND CONFINED SPACES

11.5.1 Cargo spaces

There shall be at least one safe and accessible ladder in any cargo space which employees must enter. When any fixed ladder is visibly unsafe, the employer shall prohibit its use by employees. Straight ladders of adequate strength and suitably secured against shifting or slipping shall be provided as necessary when fixed ladders in cargo spaces do not meet the requirements of this section. When conditions are such that a straight ladder cannot be used, a Jacob's ladder meeting the requirements of 29 CFR 1915.74(d) may be used. Fixed ladders or straight ladders provided for access to cargo spaces shall not be used at the same time that cargo drafts, equipment, materials, scrap or other loads are entering or leaving the hold. Before using these ladders to enter or leave the hold, the employee shall be required to inform the winchman or crane signalman of his intention.

11.5.2 Confined spaces

More than one means of access shall be provided to a confined space in which employees are working and in which the work may generate a hazardous atmosphere in the space except where the structure or arrangement of the vessel makes this provision impractical. When the ventilation ducts required by these regulations must pass through these means of access, the ducts shall be of such a type and so arranged as to permit free passage of an employee through at least two of these means of access.

11.6 WORKING SURFACES

When employees are boarding, leaving, or working from small boats or floats, they shall be protected by personal flotation devices meeting the requirements of 29 CFR 1915.154.

12. Hot Work Procedures

EMPLOYEES

- Do not enter spaces to perform hot work that have not been gas freed.
- Properly use all personal protective equipment (respirators, eye protection, and gloves) that has been provided to you.
- Do not use torches or welding tools if you have not been trained in their use.

EMPLOYER

- Ensure that all voids (spaces) have been gas freed before initiating hot work.
- Provide all workers the necessary ventilation and/or personal protective equipment (respirators, eye protection, and gloves).
- Ensure that all workers have been properly trained in the use of torches, welding tools, and the hazards associated with such use.

12.1 WELDING PROCEDURES

12.1.1 Ventilation and protection in welding, cutting and heating

12.1.1.1 Mechanical ventilation requirements

Mechanical ventilation shall meet the following requirements:

- Mechanical ventilation shall consist of either general mechanical ventilation systems or local exhaust systems.
- General mechanical ventilation shall be of sufficient capacity and so arranged as to produce the number of air changes necessary to maintain welding fumes and smoke within safe limits.
- Local exhaust ventilation shall consist of freely movable hoods intended to be placed by the welder or burner as close as practicable to the work. This system shall be of sufficient capacity and so arranged as to remove fumes and smoke at the source and keep the concentration of them in the breathing zone within safe limits.
- Contaminated air exhausted from a working space shall be discharged into the open air or otherwise clear of the source of intake air.
- All air replacing that withdrawn shall be clean and respirable.
- Oxygen shall not be used for ventilation purposes, comfort cooling, blowing dust or dirt from clothing, or for cleaning the work area.

12.1.1.2 Welding, cutting and heating in confined spaces

Except as provided in this section either general ventilation meeting the requirements of this section shall be provided whenever welding, cutting or heating is performed in a confined space.

The means of access shall be provided to a confined space and ventilation ducts to this space shall be arranged in accordance with confined space procedures described in the section addressing confined spaces.

When sufficient ventilation cannot be obtained without blocking the means of access,

employees in the confined space shall be protected by air line respirators in accordance with the requirements of this section, and an employee on the outside of such a confined space shall be assigned to maintain communication with those working within it and to aid them in an emergency.

12.1.1.3 Welding, cutting or heating of metals of toxic significance

Welding, cutting or heating in any enclosed spaces aboard the vessel involving the metals specified below shall be performed with either general mechanical or local exhaust ventilation meeting the requirements described above:

- Zinc-bearing base or filler metals or metals coated with zinc-bearing materials.
- Lead base metals.
- Cadmium-bearing filler materials.
- Chromium bearing metals or metals coated with chromium-bearing materials.

Welding, cutting or heating in any enclosed spaces aboard the vessel involving the metals specified below shall be performed with local exhaust ventilation in accordance with the requirements of this section or employees shall be protected by air line respirators in accordance with the requirements of this section:

- Metals containing lead, other than as an impurity, or metals coated with lead-bearing materials.
- Cadmium-bearing or cadmium coated base metals.
- Metals coated with mercury-bearing metals.
- Beryllium-containing base or filler metals. Because of its high toxicity, work involving beryllium shall be done with both local exhaust ventilation and air line respirators.

Employees performing such operations in the open air shall be protected by filter type respirators in accordance with the requirements of this section, except that employees performing such operations on beryllium-containing base or filler metals shall be protected by air line respirators in accordance with the requirements of this section.

Other employees exposed to the same atmosphere as the welders or burners shall be protected in the same manner as the welder or burner.

12.1.1.4 General welding, cutting, and heating

Welding, cutting and heating not involving conditions or materials described below may normally be done without mechanical ventilation or respiratory protective equipment, but where, because of unusual physical or atmospheric conditions, an unsafe accumulation of contaminants exists, suitable mechanical ventilation or respiratory protective equipment shall be provided.

Employees performing any type of welding, cutting or heating shall be protected by suitable eye protective equipment in accordance with the requirements above. Residues and cargoes of metallic ores of toxic significance shall be removed from the area or protected from the heat before ship repair work that involves welding, cutting or heating is begun.

12.1.2 Fire prevention

When practical, objects to be welded, cut or heated shall be moved to a designated safe location or, if the object to be welded, cut or heated cannot be readily moved, all movable fire hazards including residues of combustible bulk cargoes in the vicinity shall be taken to a safe place. If the object to be welded, cut or heated cannot be moved and if all the fire hazards including combustible cargoes cannot be removed, positive means shall be taken to confine the heat, sparks, and slag, and to protect the immovable fire hazards from them.

When welding, cutting or heating is performed on tank shells, decks, overheads and bulkheads, since direct penetration of sparks or heat transfer may introduce a fire hazard to an adjacent compartment, the same precautions shall be taken on the opposite side as are taken on the side on which the welding is being performed.

In order to eliminate the possibility of fire in confined spaces as a result of gas escaping through leaking or improperly closed torch valves, the gas supply to the torch shall be positively shut off at some point outside the confined space whenever the torch is not to be used or whenever the torch is left unattended for a substantial period of time, such as during the lunch hour. Overnight and at the change of shifts, the torch and hose shall be removed from the confined space. Open end fuel gas and oxygen hoses shall be immediately removed from confined spaces when they are disconnected from the torch or other gas-consuming device.

12.1.3 Welding, cutting and heating in way of preservative coatings

Before welding, cutting or heating is commenced on any surface covered by a preservative coating whose flammability is not known, a test shall be made by a competent person to determine its flammability. Preservative coatings shall be considered to be highly flammable when scrapings burn with extreme rapidity.

Precautions shall be taken to prevent ignition of highly flammable hardened preservative coatings. When coatings are determined to be highly flammable they shall be stripped from the area to be heated to prevent ignition, or, where shipbreaking is involved, the coatings may be burned away under controlled conditions. A 1 1/2 inch or larger fire hose with fog nozzle, which has been uncoiled and placed under pressure, shall be immediately available for instant use in the immediate vicinity, consistent with avoiding freezing of the hose.

Protection against toxic preservative coatings

In enclosed spaces, all surfaces covered with toxic preservatives shall be stripped of all toxic coatings for a distance of at least 4 inches from the area of heat application or the employees shall be protected by air line respirators meeting the requirements above.

In the open air, employees shall be protected by a filter type respirator in accordance with the requirements in this section.

12.1.4 Welding, cutting and heating of hollow metal containers and structures

Drums, containers, or hollow structures that have contained flammable substances shall, before welding, cutting, or heating is undertaken on them, either be filled with water or thoroughly cleaned of such substances and ventilated and tested.

Before heat is applied to a drum, container, or hollow structure, a vent or opening shall be provided for the release of any built-up pressure during the application of heat.

Before welding, cutting, heating or brazing is begun on structural voids such as skegs, bilge keels, fair waters, masts, booms, support stanchions, pipe stanchions or railings, a competent

person shall inspect the object and, if necessary, test it for the presence of flammable liquids or vapors. If flammable liquids or vapors are present, the object shall be made safe.

Objects such as those listed above shall also be inspected to determine whether water or other non-flammable liquids are present which, when heated, would build up excessive pressure. If such liquids are determined to be present, the object shall be vented, cooled, or otherwise made safe during the application of heat.

Jacketed vessels shall be vented before and during welding, cutting or heating operations in order to release any pressure that may build up during the application of heat.

12.1.5 Gas welding and cutting

12.1.5.1 Transporting, moving and storing compressed gas cylinders

Valve protection caps shall be in place and secure. Oil shall not be used to lubricate protection caps. When cylinders are hoisted, they shall be secured on a cradle, slingboard or pallet. They shall not be hoisted by means of magnets or choker slings. Cylinders shall be moved by tilting and rolling them on their bottom edges. They shall not be intentionally dropped, struck, or permitted to strike each other violently. When cylinders are transported by vehicle, they shall be secured in position. Valve protection caps shall not be used for lifting cylinders from one vertical position to another. Bars shall not be used under valves or valve protection caps to pry cylinders loose when frozen. Warm, not boiling, water shall be used to thaw cylinders loose.

Unless cylinders are firmly secured on a special carrier intended for this purpose, regulators shall be removed and valve protection caps put in place before cylinders are moved. A suitable cylinder truck, chain, or other steadying device shall be used to keep cylinders from being knocked over while in use. When work is finished, when cylinders are empty or when cylinders are moved at any time, the cylinder valves shall be closed. Acetylene cylinders shall be secured in an upright position at all times except, if necessary, for short periods of time while cylinders are actually being hoisted or carried.

12.1.5.2 Placing cylinders

Cylinders shall be kept far enough away from the actual welding or cutting operation so that sparks, hot slag or flame will not reach them. When this is impractical, fire resistant shields shall be provided. Cylinders shall be placed where they cannot become part of an electrical circuit. Electrodes shall not be struck against a cylinder to strike an arc. Fuel gas cylinders shall be placed with valve end up whenever they are in use. They shall not be placed in a location where they would be subject to open flame, hot metal, or other sources of artificial heat. Cylinders containing oxygen or acetylene or other fuel gas shall not be taken into confined spaces.

12.1.5.3 Treatment of cylinders

Cylinders, whether full or empty, shall not be used as rollers or supports. No person other than the gas supplier shall attempt to mix gases in a cylinder. No one except the owner of the cylinder or person authorized by him shall refill a cylinder. No one shall use a cylinder‘s contents for purposes other than those intended by the supplier. Only cylinders bearing Interstate Commerce Commission identification and inspection markings shall be used. No damaged or defective cylinder shall be used.

12.1.5.4 Use of fuel gas

The employer shall thoroughly instruct employees in the safe use of fuel gas, as follows:

- Before connecting a regulator to a cylinder valve, the valve shall be opened slightly and closed immediately. (This action is generally termed "cracking" and is intended to clear the valve of dust or dirt that might otherwise enter the regulator.) The person cracking the valve shall stand to one side of the outlet, not in front of it. The valve of a fuel gas cylinder shall not be cracked where the gas would reach welding work, sparks, flame or other possible sources of ignition.

- The cylinder valve shall always be opened slowly to prevent damage to the regulator. To permit quick closing, valves on fuel gas cylinders shall not be opened more than 1 12 turns. When a special wrench is required, it shall be left in position on the stem of the valve while the cylinder is in use so that the fuel gas flow can be shut off quickly in case of an emergency. In the case of manifolded or coupled cylinders, at least one such wrench shall always be available for immediate use. Nothing shall be placed on top of a fuel gas cylinder, when in use, which may damage the safety device or interfere with the quick closing of the valve.

- Fuel gas shall not be used from cylinders through torches or other devices which are equipped with shut-off valves without reducing the pressure through a suitable regulator attached to the cylinder valve or manifold.

- Before a regulator is removed from a cylinder valve, the cylinder valve shall always be closed and the gas released from the regulator.

- If, when the valve on a fuel gas cylinder is opened, there is found to be a leak around the valve stem, the valve shall be closed and the gland nut tightened. If this action does not stop the leak, the use of the cylinder shall be discontinued, and it shall be properly tagged and removed from the vessel. In the event that fuel gas should leak from the cylinder valve rather than from the valve stem and the gas cannot be shut off, the cylinder shall be properly tagged and removed from the vessel. If a regulator attached to a cylinder valve will effectively stop a leak through the valve seat, the cylinder need not be removed from the vessel.

- If a leak should develop at a fuse plug or other safety device, the cylinder shall be removed from the vessel.

12.1.5.5 Fuel gas and oxygen manifolds

Fuel gas and oxygen manifolds shall bear the name of the substance they contain in letters at least one (1) inch high which shall be either painted on the manifold or on a sign permanently attached to it. Fuel gas and oxygen manifolds shall be placed in safe and accessible locations in the open air. They shall not be located within enclosed spaces. Manifold hose connections, including both ends of the supply hose that lead to the manifold, shall be such that the hose cannot be interchanged between fuel gas and oxygen manifolds and supply header connections. Adapters shall not be used to permit the interchange of hose. Hose connections shall be kept free of grease and oil. When not in use, manifold and header hose connections shall be capped. Nothing shall be placed on top of a manifold, when in use, which will damage the manifold or interfere with the quick closing of the valves.

12.1.5.6 Hose

Fuel gas hose and oxygen hose shall be easily distinguishable from each other. The contrast may be made by different colors or by surface characteristics readily distinguishable by the sense of touch. Oxygen and fuel has hoses shall not be interchangeable. A single hose having more than one gas passage, a wall failure of which would permit the flow of one gas into the other gas passage, shall not be used. When parallel sections of oxygen and fuel gas hose are

taped together not more than 4 inches out of 8 inches shall be covered by tape. All hose carrying acetylene, oxygen, natural or manufactured fuel gas, or any gas or substance which may ignite or enter into combustion or be in any way harmful to employees, shall be inspected at the beginning of each shift. Defective hose shall be removed from service. Hose which has been subjected to flashback or which shows evidence of severe wear or damage shall be tested to twice the normal pressure to which it is subject, but in no case less than two hundred (200) psi. Defective hose or hose in doubtful condition shall not be used. Hose couplings shall be of the type that cannot be unlocked or disconnected by means of a straight pull without rotary motion. Boxes used for the stowage of gas hose shall be ventilated.

12.1.5.7 Torches

Clogged torch tip openings shall be cleaned with suitable cleaning wires, drills or other devices designed for such purpose. Torches shall be inspected at the beginning of each shift for leaking shutoff valves, hose couplings, and tip connections. Defective torches shall not be used. Torches shall be lighted by friction lighters or other approved devices, and not by matches or from hot work. Pressure regulators. Oxygen and fuel gas pressure regulators including their related gauges shall be in proper working order while in use.

12.1.6 Arc welding and cutting

12.1.6.1 Manual electrode holders

Only manual electrode holders which are specifically designed for arc welding and cutting and are of a capacity capable of safely handling the maximum rated current required by the electrodes shall be used. Any current carrying parts passing through the portion of the holder which the arc welder or cutter grips in his hand, and the outer surfaces of the jaws of the holder, shall be fully insulated against the maximum voltage encountered to ground.

12.1.6.2 Welding cables and connectors

All arc welding and cutting cables shall be of the completely insulated, flexible type, capable of handling the maximum current requirements of the work in progress, taking into account the duty cycle under which the arc welder or cutter is working. Only cable free from repair or splices for a minimum distance of ten (10) feet from the cable end to which the electrode holder is connected shall be used, except that cables with standard insulated connectors or with splices whose insulating quality is equal to that of the cable are permitted. When it becomes necessary to connect or splice lengths of cable one to another, substantial insulated connectors of a capacity at least equivalent to that of the cable shall be used. If connections are effected by means of cable lugs, they shall be securely fastened together to give good electrical contact, and the exposed metal parts of the lugs shall be completely insulated. Cables in poor repair shall not be used. When a cable other than the cable lead referred to above becomes worn to the extent of exposing bare conductors, the portion thus exposed shall be protected by means of rubber and friction tapes or other equivalent insulation.

12.1.6.3 Ground returns and machine grounding

A ground return cable shall have a safe current carrying capacity equal to or exceeding the specified maximum output capacity of the arc welding or cutting unit which it services. When a single ground return cable services more than one unit, its safe current carrying capacity shall equal or exceed the total specified maximum output capacities of all the units which it services. Structures or pipe lines, except pipe lines containing gases of flammable liquids or conduits containing electrical circuits, may be used as part of the ground return circuit, provided that the pipe or structure has a current carrying capacity equal to that required above. When a structure or pipe line is employed as a ground return circuit, it shall be determined that the required electrical contact exists at all joints. The generation of an arc, sparks or heat at any point shall cause rejection of the structure as a ground circuit. When a

structure or pipe line is continuously employed as a ground return circuit, all joints shall be bonded, and periodic inspections shall be conducted to ensure that no condition of electrolysis or fire hazard exists by virtue of such use. The frames of all arc welding and cutting machines shall be grounded either through a third wire in the cable containing the circuit conductor or through a separate wire which is grounded at the source of the current. Grounding circuits, other than by means of the vessel‘s structure, shall be checked to ensure that the circuit between the ground and the grounded power conductor has resistance low enough to permit sufficient current to flow to cause the fuse or circuit breaker to interrupt the current.

All ground connections shall be inspected to ensure that they are mechanically strong and electrically adequate for the required current.

12.1.6.4 Operating instructions

Employers shall instruct employees in the safe means of arc welding and cutting as follows:

- When electrode holders are to be left unattended, the electrodes shall be removed and the holders shall be so placed or protected that they cannot make electrical contact with employees or conducting objects.
- Hot electrode holders shall not be dipped in water, since to do so may expose the arc welder or cutter to electric shock.
- When the arc welder or cutter has occasion to leave his work or to stop work for any appreciable length of time, or when the arc welding or cutting machine is to be moved, the power supply switch to the equipment shall be opened.
- Any faulty or defective equipment shall be reported to the supervisor.

12.1.6.5 Shielding

Whenever practicable, all arc welding and cutting operations shall be shielded by noncombustible or flame-proof screens which will protect employees and other persons working in the vicinity from the direct rays of the arc.

12.2 PROCEDURES FOR HOT WORK

12.2.1 Initial Operations

After the initial mooring of a vessel, no personnel shall enter the vessel prior to the inspection of the vessel by a marine chemist unless specifically authorized by the competent person. No smoking or open flames shall be permitted on board during tie up operations, until cutting procedures have been authorized. A competent person shall make a preliminary inspection to authorize personnel to board and begin hatch opening operations. During the hatch opening operations, personnel shall work in-groups of two or more to test previously closed spaces for oxygen concentration. No personnel shall be permitted to enter these spaces unless the test shows oxygen content to be at least 19.5%.

Torch cutting of windows for the purpose of installing gangways prior to the marine chemist’s inspection shall be performed with the specific authorization of the marine chemist. At the completion of the marine chemist’s inspection, he/she shall issue a certificate demonstrating the completion of the inspection.

12.2.2 General Operations

Cutting operations shall proceed according to the marine chemist's instructions at the authorization of the competent person as issued to the foreman and/or lead men. A minimum of two water line hoses, not less than 1½" in diameter with fog nozzles, shall be fully charged and on board before the commencement of cutting.

A fire watch shall be kept during cutting operations and for a minimum period of one hour after all cutting operations cease. A fire permit from the Philadelphia Fire Department shall be obtained before any hot work is started. A visual inspection of the torches and torch hoses shall be made at the beginning of every shift and after every lunch break, with necessary repairs being made. Fire lines shall be visually inspected and tested at the beginning of each shift. All damage to the fire lines shall be repaired or the hose shall be replaced as soon as damage is noted. All hoses shall be pressure-tested and dated. Fire fighting training shall be held monthly and documented by the Environmental Supervisor.

12.2.3 End of Day Operations

Aboard ship, all gas hoses shall be moved to the existing deck and neatly coiled, with the gas turned off at the manifold. In the yard, all gas hoses shall be neatly coiled at the manifold and the supply valves closed.

13. Water Safety

EMPLOYEES

- If you are unable to swim, you MUST wear an approved life vest at all times.
- Know where the life rings and ladder(s) are located in the event of an emergency.

EMPLOYER

- Provide approved personal flotation devices (PFDs) for all workers. Ensure that these devices are in good working order.
- Ensure that PFDs are worn by all workers who are unable to swim.
- At a minimum, provide three life rings aboard the vessel. One life ring must be forward, one aft, and one must be located at the gangway.
- Provide a permanent or portable ladder in the vicinity of the ship that is long enough to help an employee out of the water in the event that they should fall into the water.

In order to protect workers from any water hazards that may be incurred, the following rules will be followed.

13.1 PERSONAL FLOTATION DEVICES

Personal flotation devices (PFD) (life preservers, life jackets and work vests) worn by each affected employee shall be any United States Coast Guard (USCG) approved and marked Type I PFD, Type II PFD, or Type III PFD; or PFDs shall be a USCG approved Type V PFD which is marked for use as a work vest, for commercial use, or for use on vessels. USCG approval is pursuant to 46 CFR part 160, subpart Q, Coast Guard Lifesaving Equipment Specifications. Prior to each use, personal flotation devices shall be inspected for dry rot, chemical damage, or other defects that may affect their strength and buoyancy. Defective personal flotation devices shall not be used.

It is American Marine's company policy to require all workers who are working on ship's deck to wear a life vest if they are unable to swim.

13.2 RING LIFE BUOYS AND LADDERS

When work is being performed on a floating vessel 200 feet (61 m) or more in length, at least three 30-inch (0.76 m) U.S. Coast Guard approved ring life buoys with lines attached shall be located in readily visible and accessible places. Ring life buoys shall be located one forward, one aft, and one at the access to the gangway. On floating vessels under 200 feet (61 m) in length, at least one 30-inch (0.76 m) U.S. Coast Guard approved ring life buoy with line attached shall be located at the gangway. At least one 30-inch (0.76 m) U. S. Coast Guard approved ring life buoy with a line attached shall be located on each staging alongside of a floating vessel on which work is being performed. At least 90 feet (27 m) of line shall be attached to each ring life buoy. There shall be at least one portable or permanent ladder in the vicinity of each floating vessel on which work is being performed. The ladder shall be of sufficient length to assist employees to reach safety in the event they fall into the water.

14. Personal Fall Arrest Systems (PFAS)

EMPLOYEE

- Know when to use fall protection.
- Inspect all PFAS before each use.
- Do not use any fall protection equipment that is damaged in any way.
- Any damaged equipment shall be turned over to your supervisor as soon as damage is discovered.
- Ensure that fall protection equipment is properly used, cared for, and stored.

EMPLOYER

- Train all employees on the proper use and inspection of fall protection devices.
- Train all employees in the proper care and storage of fall protection devices.
- Ensure that any damaged equipment is removed from service upon discovery of damage. Damage equipment shall not be repaired, but destroyed and thrown away

The criteria of this section apply to PFAS and their use. Effective January 1, 1998, body belts and non-locking snaphooks are not acceptable as part of a personal fall arrest system.

14.1 CRITERIA FOR CONNECTORS AND ANCHORAGES

Connectors shall be made of drop forged, pressed, or formed steel or shall be made of materials with equivalent strength. Connectors shall have a corrosion-resistant finish, and all surfaces and edges shall be smooth to prevent damage to the interfacing parts of the system.

D-rings and snaphooks shall be capable of sustaining a minimum tensile load of 5,000 pounds (22.2 KN), and shall be proof-tested to a minimum tensile load of 3,600 pounds (16 KN) without cracking, breaking, or being permanently deformed. Snaphooks shall be sized to be compatible with the member to which they are connected to prevent unintentional disengagement of the snaphook caused by depression of the snaphook keeper by the connected member, or shall be of a locking type that is designed and used to prevent disengagement of the snap-hook by contact of the snaphook keeper by the connected member. Unless of a locking type which is designed and used to prevent disengagement from the following connections, snaphooks shall not be engaged:

- directly to webbing, rope or wire rope;
- to each other;
- to a D-ring to which another snaphook or other connector is attached;
- to a horizontal lifeline; or
- to any object that is incompatibly shaped or dimensioned in relation to the snaphook such that unintentional disengagement could occur by the connected object being able to depress the snaphook keeper and release itself.

On suspended scaffolds or similar work platforms with horizontal lifelines that may become vertical lifelines, the devices used for connection to the horizontal lifeline shall be capable of locking in any direction on the lifeline.

Anchorages used for attachment of personal fall arrest equipment shall be independent of any anchorage being used to support or suspend platforms. Anchorages shall be capable of

supporting at least 5,000 pounds (22.2 KN) per employee attached, or shall be designed, installed, and used as follows:

- as part of a complete personal fall arrest system which maintains a safety factor of at least two; and
- under the direction and supervision of a qualified person.

14.2 CRITERIA FOR LIFELINES, LANYARDS, AND PERSONAL FALL ARREST SYSTEMS

When vertical lifelines are used, each employee shall be provided with a separate lifeline. Vertical lifelines and lanyards shall have a minimum tensile strength of 5,000 pounds (2.2 KN).

Self-retracting lifelines and lanyards that automatically limit free fall distances to 2 feet (0.61 m) or less shall be capable of sustaining a minimum tensile load of 3000 pounds (13.3 KN) applied to a self-retracting lifeline or lanyard with the lifeline or lanyard in the fully extended position. Self-retracting lifelines and lanyards which do not limit free fall distance to 2 feet (0.61 m) or less, ripstitch lanyards and tearing and deforming lanyards shall be capable of sustaining a minimum static tensile load of 5,000 pounds (22.2 KN) applied to the device when they are in the fully extended position.

Horizontal lifelines shall be designed, installed, and used under the supervision of a qualified person, and shall only be used as part of a complete personal fall arrest system that maintains a safety factor of at least two.

Effective November 20, 1996, personal fall arrest systems shall:

- limit the maximum arresting force on a falling employee to 900 pounds (4 KN) when used with a body belt;
- limit the maximum arresting force on a falling employee to 1,800 pounds (8 KN) when used with a body harness;
- bring a falling employee to a complete stop and limit the maximum deceleration distance an employee travels to 3.5 feet (1.07 m), and
- have sufficient strength to withstand twice the potential impact energy of an employee free falling a distance of 6 feet (1.8 m), or the free fall distance permitted by the system, whichever is less;

Personal fall arrest systems shall be rigged such that an employee can neither free fall more than 6 feet (1.8 m) nor contact any lower level.

14.3 CRITERIA FOR SELECTION, USE AND CARE OF SYSTEMS AND SYSTEM COMPONENTS

Lanyards shall be attached to employees using personal fall arrest systems, as follows:

- The attachment point of a body harness shall be located in the center of the wearer's back near the shoulder level, or above the wearer's head. If the free fall distance is limited to less than 20 inches, the attachment point may be located in the chest position; and
- The attachment point of a body belt shall be located in the center of the wearer's back.

Ropes and straps (webbing) used in lanyards, lifelines and strength components of body belts and body harnesses shall be made from synthetic fibers or wire rope. Ropes, belts, harnesses, and lanyards shall be compatible with their hardware. Lifelines and lanyards shall be protected against cuts, abrasions, burns from hot work operations and deterioration by acids, solvents, and other chemicals.

Personal fall arrest systems shall be inspected prior to each use for mildew, wear, damage, and other deterioration. Defective components shall be removed from service. Personal fall arrest systems and components subjected to impact loading shall be immediately removed from service and shall not be used again for employee protection until inspected and determined by a qualified person to be undamaged and suitable for reuse.

American Marine shall provide for prompt rescue of employees in the event of a fall or shall ensure that employees are able to rescue themselves.

Body belts shall be at least one and five eighths inches (4.1 cm) wide. Personal fall arrest systems and components shall be used only for employee fall protection and not to hoist materials.

14.4 TRAINING

Before using personal fall arrest equipment, each affected employee shall be trained to understand the application limits of the equipment and proper hook-up, anchoring, and tie-off techniques. Affected employees shall also be trained so that they can demonstrate the proper use, inspection, and storage of their equipment.

15. Crane and Rigging Safety

EMPLOYEE

- Inspect cranes and rigging daily before beginning work.
- Do not perform work with defective gear; make all repairs immediately.
- If the crane operator you are unable to see the load being handled, have a signalman to assist you while performing work.
- Ensure that other employees are notified before loads are lifted and moved.

EMPLOYER

- Inspect cranes and rigging daily before beginning work.
- Ensure that employees do not perform work with defective gear; ensure that all repairs are made immediately.
- If the crane operator is unable to see the load being handled, provide a signalman.
- Ensure that other employees are notified before loads are lifted and moved.
- Document all employee training in crane operation and all repairs performed on cranes.

15.1 INSPECTION

All gear and equipment provided by the employer for rigging and materials handling will be inspected before each shift and when necessary, at intervals during its use to ensure that it is safe. Defective gear will be removed and repaired or replaced before further use. The safe working load of gear as specified below will not be exceeded.

15.2 Ropes, chains and slings.

15.2.1 Manila rope and manila rope slings

Manila rope and manila rope slings are not to be used, and should be immediately taken out of service, red tagged, cut up or destroyed and disposed of.

15.2.2 Wire rope and wire rope slings

Tables G-2 through G-5 at the end of this section (also found in 1915.118) will be used to determine the safe working loads of various sizes and classifications of improved plow steel wire rope and wire rope slings with various types of terminals. For sizes, classifications and grades not included in these tables, the safe working load recommended by the manufacturer for specific, identifiable products will be followed, provided that a safety factor of not less than five (5) is maintained. Protruding ends of strands in splices on slings and bridles will be covered or blunted. Where U-bolt wire rope clips are used to form eyes, Table G-6 at the end of this section (also in 1915.118) will be used to determine the number and spacing of clips. The U-bolt will be applied so that the "U" section is in contact with the dead end of the rope. Wire rope will not be secured by knots.

15.2.3 Chains and chain slings

(1) Tables G-7 and G-8 at the end of this section (also in 1915.118) will be used to determine the working load limit of various sizes of wrought iron and alloy steel chains and chain slings, except that higher safe working loads are permissible when recommended by the manufacturer for specific, identifiable products. All sling chains, including end fastenings, will be given a visual inspection before being used on the job. A thorough inspection of all

chains in use will be made every 3 months. Each chain will bear an indication of the month in which it was thoroughly inspected. The thorough inspection will include inspection for wear, defective welds, deformation and increase in length or stretch. Interlink wear, not accompanied by stretch in excess of 5 percent, will be noted and the chain removed from service when maximum allowable wear at any point of link, as indicated in Table G-9 at the back of this section (also in 1915.118) has been reached. Chain slings will be removed from service when, due to stretch, the increase in length of a measured section exceeds five (5) percent; when a link is bent, twisted or otherwise damaged; or when raised scarfs or defective welds appear. All repairs to chains will be made under qualified supervision. Links or portions of the chain found to be defective as described in this section will be replaced by links having proper dimensions and made of material similar to that of the chain. Before repaired chains are returned to service, they will be proof tested to the proof test load recommended by the manufacturer. Wrought iron chains in constant use will be annealed or normalized at intervals not exceeding six months when recommended by the manufacturer. The chain manufacturer will be consulted for recommended procedures for annealing or normalizing. Alloy chains will never be annealed. A load will not be lifted with a chain having a kink or knot in it. A chain will not be shortened by bolting, wiring or knotting.

15.3 SHACKLES AND HOOKS

15.3.1 Shackles

Table G-10 at the end of this section (also in 1915.118) will be used to determine the safe working loads of various sizes of shackles, except that higher safe working loads are permissible when recommended by the manufacturer for specific, identifiable products, provided that a safety factor of not less than (5) is maintained.

15.3.2 Hooks

The manufacturer's recommendations will be followed in determining the safe working loads of the various sizes and types of specific and identifiable hooks. All hooks for which no applicable manufacturer's recommendations are available will be tested to twice the intended safe working load before they are initially put into use. The employer will maintain and keep readily available a certification record that includes the date of such tests, the signature of the person who performed the test and an identifier for the hook that was tested. Loads will be applied to the throat of the hook since loading the point overstresses and bends or springs the hook.

Hooks will be inspected periodically to see that they have not been bent by overloading. Bent or sprung hooks will not be used.

15.4 CHAIN FALLS AND PULL-LIFTS

Chain falls and pull-lifts will be clearly marked to show the capacity and the capacity will not be exceeded. Chain falls will be regularly inspected to ensure that they are safe, particular attention being given to the lift chain, pinion, sheaves and hooks for distortion and wear. Pull-lifts will be regularly inspected to ensure that they are safe, particular attention being given to the ratchet, pawl, chain and hooks for distortion and wear. Straps, shackles, and the beam or overhead structure to which a chain fall or pull-lift is secured will be of adequate strength to support the weight of load plus gear. The upper hook will be moused or otherwise secured against coming free of its support. Scaffolding will not be used as a point of attachment for lifting devices such as tackles, chain falls, and pull-lifts unless the scaffolding is specifically designed for that purpose.

15.5 HOISTING AND HAULING EQUIPMENT

15.5.1 Derrick and crane certification

Derricks and cranes which are part of, or regularly placed aboard barges, other vessels, or on wingwalls of floating drydocks, and are used to transfer materials or equipment from or to a vessel or drydock, will be tested and certificated in accordance with the standards provided in 29 CFR 1919 by persons accredited for the purpose. The moving parts of hoisting and hauling equipment will be guarded.

15.5.2 Mobile crawler or truck cranes used on a vessel

The maximum manufacturer's rated safe working loads for the various working radii of the boom and the maximum and minimum radii at which the boom may be safely used with and without outriggers will be conspicuously posted near the controls and will be visible to the operator. A radius indicator will be provided. The posted safe working loads of mobile crawler or truck cranes under the conditions of use will not be exceeded.

15.5.3 Accessible Areas

Accessible areas within the swing radius of the outermost part of the body of a revolving derrick or crane wither permanently or temporarily mounted, will be guarded in such a manner as to prevent an employee from being in such a position as to be struck by the crane or caught between the crane and fixed parts of the vessel or of the crane itself.

15.5.4 Marine railways

The cradle or carriage on the marine railway will be positively blocked or secured when in the hauled position to prevent it from being accidentally released.

15.6 USE OF GEAR

Loads will be safely rigged before being hoisted. When slings are secured to eye-bolts, the slings will be so arranged, using spreaders if necessary, that the pull is within 20 degrees of the axis of the bolt. Slings will be padded by means of wood blocks or other suitable material where they pass over sharp edges or corners of loads so as to prevent cutting or kinking. Skips will be rigged to be handled by not less than 3-legged bridles, and all legs will always be used. When open-end skips are used, means will be taken to prevent the contents from falling. Loose ends of idle legs of slings in use will be hung on the hook.

Employees will not be permitted to ride the hook or the load. Loads (tools, equipment or other materials) will not be swung or suspended over the heads of employees. Pieces of equipment or structure susceptible to falling or dislodgement will be secured or removed as early as possible.

An individual who is familiar with the signal code in use will be assigned to act as a signalman when the hoist operator cannot see the load being handled. Communications will be made by means of clear and distinct visual or auditory signals except that verbal signals will not be permitted. Pallets, when used, will be of such material and construction and so maintained as to safely support and carry the loads being handled on them.

A section of hatch through which materials or equipment are being raised, lowered, moved, or otherwise shifted manually or by a crane, winch, hoist, or derrick, will be completely opened. The beam or pontoon left in place adjacent to an opening will be sufficiently lashed, locked or otherwise secured to prevent it from being unshipped so that it cannot be displaced by accident. Hatches will not be open or closed while employees are in the square of the

hatch below. Before loads or empty lifting gear are raised, lowered, or swung, clear and sufficient advance warning will be given to employees in the vicinity of such operations. At no time will an employee be permitted to place himself in a hazardous position between a swinging load and a fixed object.

15.7 QUALIFICATIONS OF OPERATORS

Only those employees who understand the signs, notices, and operating instructions, and are familiar with the signal code in use, will be permitted to operate a crane, winch, or other power operated hoisting apparatus. No employee known to have defective uncorrected eyesight or hearing, or to be suffering from heart disease, epilepsy, or similar ailments which may suddenly incapacitate him, will be permitted to operate a crane, winch or other power operated hoisting apparatus.

16. Hearing Conservation Program

EMPLOYEES

- If it is hard to hear another person talking or if hearing seems affected from work in certain areas, notify your supervisor so that a noise exposure survey may be performed.
- Use supplied hearing protection appropriately wherever it is necessary.

EMPLOYER

- Areas where noise is prevalent (interferes with conversation) should be investigated to determine whether the noise exposure warrants a hearing conservation program. For instance, if it is hard to hear another person talking or if hearing seems affected from work in certain areas, a noise exposure survey should be conducted.
- Where a hearing conservation program is necessary, workers should be trained in the proper use of hearing protection. Document this training.
- Supply hearing protection to affected employees and require its proper use.
- Provide annual audiometric testing for employees.
- Maintain records of noise exposure surveys and medical monitoring.

American Marine will provide protection against the effects of noise exposure when the sound levels exceed those shown in Table G-16 of 29 CFR 1910.95. When employees are subjected to noise levels exceeding those listed in Table G-16, feasible administrative or engineering controls will be utilized. If such controls fail to reduce sound levels to within the levels of Table G-16, American Marine will provide personal protective equipment to reduce sound levels within the parameters of the table.

29 CFR 1910.95 TABLE G-16 - PERMISSIBLE NOISE EXPOSURES

Duration per day, hours	Sound level dBA slow response
8	90
6	92
4	95
3	97
2	100
1 ½	102
1	105
½	110
¼ or less	115

NOTE: When the daily noise exposure is composed of two or more periods of noise exposure of different levels, their combined effect should be considered, rather than the individual effect of each. If the sum of the following fractions: C (1)/T (1) + C(2)/T(2) C(n)/T(n) exceeds unity, then, the mixed exposure should be considered to exceed the limit value. Cn indicates the total time of exposure at a specified noise level, and Tn indicates the total time of exposure permitted at that level. Exposure to impulsive or impact noise should not exceed 140-dB peak sound pressure level.

16.1 HEARING CONSERVATION PROGRAM

American Marine will administer a continuing, effective hearing conservation program, as described in this section, whenever employee noise exposures equal or exceed an 8-hour time-weighted average sound level (TWA) of 85 decibels measured on the A scale (slow response) or, equivalently, a dose of fifty (50) percent. For purposes of the hearing conservation program, employee noise exposures will be computed in accordance with appendix A and Table G-16a of 29 CFR 1910.95, and without regard to any attenuation provided by the use of personal protective equipment. An 8-hour time-weighted average of 85 decibels or a dose of fifty percent will also be referred to as the Action Level.

16.2 MONITORING

When information indicates that any employee's exposure may equal or exceed an 8-hour time-weighted average of 85 decibels, American Marine will develop and implement a monitoring program. The sampling strategy will be designed to identify employees for inclusion in the hearing conservation program and to enable the proper selection of hearing protectors. Where circumstances such as high worker mobility, significant variations in sound level, or a significant component of impulse noise make area monitoring generally inappropriate, American Marine will use representative personal sampling to comply with the monitoring requirements of 29 CFR 1910.95 unless American Marine can show that area sampling produces equivalent results. All continuous, intermittent and impulsive sound levels from 80 decibels to 130 decibels will be integrated into the noise measurements. Instruments used to measure employee noise exposure will be calibrated to ensure measurement accuracy. Monitoring will be repeated whenever a change in production, process, equipment or controls increases noise exposures to the extent that:

- Additional employees may be exposed at or above the action level; or
- The attenuation provided by hearing protectors being used by employees may be rendered inadequate to meet the requirements of paragraph (j) of this section.

16.2.1 Employee notification

American Marine will notify each employee who is exposed at or above an 8-hour time-weighted average of 85 decibels of the results of the monitoring.

16.2.2 Observation of monitoring

American Marine will provide affected employees or their representatives with an opportunity to observe any noise measurements conducted pursuant to this section.

16.3 AUDIOMETRIC TESTING PROGRAM

American Marine will establish and maintain an audiometric testing program as provided in this paragraph by making audiometric testing available to all employees whose exposures equal or exceed an 8-hour time-weighted average of 85 decibels. The program will be provided at no cost to employees. Audiometric tests will be performed by a licensed or certified audiologist, otolaryngologist, or other physician, or by a technician who is certified by the Council of Accreditation in Occupational Hearing Conservation, or who has satisfactorily demonstrated competence in administering audiometric examinations, obtaining valid audiograms, and properly using, maintaining and checking calibration and proper functioning of the audiometers being used. A technician who operates microprocessor audiometers does not need to be certified. A technician who performs audiometric tests must

be responsible to an audiologist, otolaryngologist or physician. All audiograms obtained pursuant to this section will meet the requirements of 29 CFR 1910.95 Appendix C: "Audiometric Measuring Instruments."

16.3.1 Baseline audiogram

Within 6 months of an employee's first exposure at or above the action level, American Marine will establish a valid baseline audiogram against which subsequent audiograms can be compared. Where mobile test vans are used to meet the audiometric testing obligation, American Marine will obtain a valid baseline audiogram within 1 year of an employee's first exposure at or above the action level. Where baseline audiograms are obtained more than 6 months after the employee's first exposure at or above the action level, employees will wearing hearing protectors for any period exceeding six months after first exposure until the baseline audiogram is obtained. Testing to establish a baseline audiogram will be preceded by at least 14 hours without exposure to workplace noise. Hearing protectors may be used as a substitute for the requirement that baseline audiograms be preceded by 14 hours without exposure to workplace noise. American Marine will notify employees of the need to avoid high levels of non-occupational noise exposure during the 14-hour period immediately preceding the audiometric examination.

16.3.2 Annual audiogram

At least annually after obtaining the baseline audiogram, American Marine will obtain a new audiogram for each employee exposed at or above an 8-hour time-weighted average of 85 decibels.

16.3.3 Evaluation of audiogram

Each employee's annual audiogram will be compared to that employee's baseline audiogram to determine if the audiogram is valid and if a standard threshold shift as defined in 9.3.6 of this section has occurred. This comparison may be done by a technician. If the annual audiogram shows that an employee has suffered a standard threshold shift, American Marine may obtain a retest within 30 days and consider the results of the retest as the annual audiogram. The audiologist, otolaryngologist, or physician will review problem audiograms and will determine whether there is a need for further evaluation. American Marine will provide to the person performing this evaluation the following information:

- A copy of the requirements for hearing conservation as set forth in paragraphs (c) through (n) of 29 CFR 1910.95;
- The baseline audiogram and most recent audiogram of the employee to be evaluated;
- Measurements of background sound pressure levels in the audiometric test room as required in 29 CFR 1910.95 Appendix D: Audiometric Test Rooms.
- Records of audiometer calibrations required by this section.

16.3.4 Follow-up procedures

If a comparison of the annual audiogram to the baseline audiogram indicates a standard threshold shift as defined in 9.3.6 of this section has occurred, the employee will be informed of this fact in writing, within 21 days of the determination. Unless a physician determines that the standard threshold shift is not work related or aggravated by occupational noise exposure, American Marine will ensure that the following steps are taken when a standard threshold shift occurs:

- Employees not using hearing protectors will be fitted with hearing protectors, trained in their use and care, and required to use them.
- Employees already using hearing protectors will be refitted and retrained in the use of hearing protectors and provided with hearing protectors offering greater attenuation if necessary.
- The employee will be referred for a clinical audiological evaluation or an otological examination, as appropriate, if additional testing is necessary or if American Marine suspects that a medical pathology of the ear is caused or aggravated by the wearing of hearing protectors.
- The employee is informed of the need for an otological examination if a medical pathology of the ear that is unrelated to the use of hearing protectors is suspected.

If subsequent audiometric testing of an employee whose exposure to noise is less than an 8-hour TWA of 90 decibels indicates that a standard threshold shift is not persistent, American Marine:

- Will inform the employee of the new audiometric interpretation; and
- May discontinue the required use of hearing protectors for that employee.

16.3.5 Revised baseline

An annual audiogram may be substituted for the baseline audiogram when, in the judgment of the audiologist, otolaryngologist or physician who is evaluating the audiogram:

- The standard threshold shift revealed by the audiogram is persistent; or
- The hearing threshold shown in the annual audiogram indicates significant improvement over the baseline audiogram.

16.3.6 Standard threshold shift

As used in this section, a standard threshold shift is a change in hearing threshold relative to the baseline audiogram of an average of 10 dB or more at 2000, 3000, and 4000 Hz in either ear. In determining whether a standard threshold shift has occurred, allowance may be made for the contribution of aging (presbycusis) to the change in hearing level by correcting the annual audiogram according to the procedure described in Appendix F: "Calculation and Application of Age Correction to Audiograms."

16.3.7 Audiometric test requirements

Audiometric tests will be pure tone, air conduction, hearing threshold examinations, with test frequencies including as a minimum 500, 1000, 2000, 3000, 4000, and 6000 Hz. Tests at each frequency will be taken separately for each ear.

Audiometric tests will be conducted with audiometers (including microprocessor audiometers) that meet the specifications of, and are maintained and used in accordance with, American National Standard Specification for Audiometers, S3.6-1969, which is incorporated by reference as specified in Sec. 1910.6. Pulsed-tone and self-recording audiometers, if used, will meet the requirements specified in Appendix C: "Audiometric Measuring Instruments." Audiometric examinations will be administered in a room meeting the requirements listed in Appendix D: "Audiometric Test Rooms."

16.3.8 Audiometer calibration

The functional operation of the audiometer will be checked before each day's use by testing a person with known, stable hearing thresholds, and by listening to the audiometer's output to

make sure that the output is free from distorted or unwanted sounds. Deviations of 10 decibels or greater require an acoustic calibration. Audiometer calibration will be checked acoustically at least annually in accordance with Appendix E: "Acoustic Calibration of Audiometers." Test frequencies below 500 Hz and above 6000 Hz may be omitted from this check. Deviations of 15 decibels or greater require an exhaustive calibration. An exhaustive calibration will be performed at least every two years in accordance with sections 4.1.2; 4.1.3.; 4.1.4.3; 4.2; 4.4.1; 4.4.2; 4.4.3; and 4.5 of the American National Standard Specification for Audiometers, S3.6-1969. Test frequencies below 500 Hz and above 6000 Hz may be omitted from this calibration.

16.4 HEARING PROTECTORS

Employers will make hearing protectors available to all employees exposed to an 8-hour time-weighted average of 85 decibels or greater at no cost to the employees. Hearing protectors will be replaced as necessary. Employers will ensure that hearing protectors are worn:

- By an employee who is required by paragraph (b)(1) of this section to wear personal protective equipment; and
- By any employee who is exposed to an 8-hour time-weighted average of 85 decibels or greater, and who:
  - Has not yet had a baseline audiogram established pursuant to paragraph (g)(5)(ii); or
  - Has experienced a standard threshold shift.

Employees will be given the opportunity to select their hearing protectors from a variety of suitable hearing protectors provided by American Marine. American Marine will provide training in the use and care of all hearing protectors provided to employees. American Marine will ensure proper initial fitting and supervise the correct use of all hearing protectors.

16.5 HEARING PROTECTOR ATTENUATION

American Marine will evaluate hearing protector attenuation for the specific noise environments in which the protector will be used. American Marine will use one of the evaluation methods described in 29 CFR 1910.95 Appendix B: "Methods for Estimating the Adequacy of Hearing Protection Attenuation." Hearing protectors must attenuate employee exposure at least to an 8-hour time-weighted average of 90 decibels as required by this section. For employees who have experienced a standard threshold shift, hearing protectors must attenuate employee exposure to an 8-hour time-weighted average of 85 decibels or below. The adequacy of hearing protector attenuation will be re-evaluated whenever employee noise exposures increase to the extent that the hearing protectors provided may no longer provide adequate attenuation. American Marine will provide more effective hearing protectors where necessary.

16.6 TRAINING PROGRAM

American Marine will institute a training program for all employees who are exposed to noise at or above an 8-hour time-weighted average of 85 decibels, and will ensure employee participation in such program. The training program will be repeated annually for each employee included in the hearing conservation program. Information provided in the training program will be updated

to be consistent with changes in protective equipment and work processes. American Marine will ensure that each employee is informed of the following:

- The effects of noise on hearing;
- The purpose of hearing protectors, the advantages, disadvantages, and attenuation of various types, and instructions on selection, fitting, use, and care; and
- The purpose of audiometric testing, and an explanation of the test procedures.

16.6.1 Access to information and training materials

American Marine will make available to affected employees or their representatives copies of this standard and will also post a copy in the workplace. American Marine will provide to affected employees any informational materials pertaining to the standard that are supplied to American Marine by the Assistant Secretary. American Marine will provide, upon request, all materials related to American Marine training and education program pertaining to this standard to the Assistant Secretary and the Director.

16.7 RECORDKEEPING

16.7.1 Exposure measurements

American Marine will maintain an accurate record of all employee exposure measurements required by paragraph (d) of this section.

16.7.2 Audiometric tests

American Marine will retain all employee audiometric test records obtained pursuant to this section. This record will include:

- Name and job classification of the employee;
- Date of the audiogram;
- The examiner's name;
- Date of the last acoustic or exhaustive calibration of the audiometer; and
- Employee's most recent noise exposure assessment.

American Marine will maintain accurate records of the measurements of the background sound pressure levels in audiometric test rooms.

16.7.3 Record retention

American Marine will retain records required in this paragraph for at least the following periods. Noise exposure measurement records will be retained for two years. Audiometric test records will be retained for the duration of the affected employee's employment.

16.7.4 Access to records

All records required by this section will be provided upon request to employees, former employees, representatives designated by the individual employee, and the Assistant Secretary. The provisions of 29 CFR 1910.20 (a)-(e) and 1910.95(m)(4)(i)(g)-(i) apply to access to records under this section.

16.7.5 Transfer of records

If American Marine ceases to do business, American marine will transfer to the successor employer all records required to be maintained by this section, and the successor employer will retain them for the remainder of the period prescribed in paragraph (m)(3) of 29 CFR 1910.95.

17. Machine Guarding

EMPLOYEE

- DO NOT remove machine guards while a machine is in operation.
- Do not operate a machine where the machine guard has been removed.
- Notify your supervisor of a missing or broken machine guard or guards.

EMPLOYER

- Ensure that machine guards have been installed as required.
- Ensure that all machine guards are working properly.
- Fix any broken machine guard or replace a broken machine guard as soon as possible.
- Establish and maintain a program of regular and periodic inspections.

17.1 TYPES OF GUARDING

One or more methods of machine guarding will be provided to protect the operator and other employees in the machine area from hazards such as those created by point of operation, ingoing nip points, rotating parts, flying chips and sparks. Examples of guarding methods include barrier guards, two-hand tripping devices, electronic safety devices, etc.

17.2 GENERAL REQUIREMENTS FOR MACHINE GUARDS

Guards will be affixed to the machine where possible and secured elsewhere if for any reason attachment to the machine is not possible. The guard will be such that it does not offer an accident hazard in itself.

17.3 POINT OF OPERATION GUARDING

Point of operation is the area on a machine where work is actually performed upon the material being processed.

The point of operation of machines, whose operation exposes an employee to injury, will be guarded. The guarding device will be in conformity with any appropriate standards therefore, or, in the absence of applicable specific standards, will be so designed and constructed as to prevent the operator from having any part of his body in the danger zone during the operating cycle.

Special hand tools for placing and removing material will be such as to permit easy handling of material without the operator placing a hand in the danger zone. Such tools will not be in lieu of other guarding required by this section, but can only be used to supplement protection provided.

The following are some of the machines that usually require point of operation guarding:

- Guillotine cutters;
- Shears;
- Alligator shears;
- Power presses;
- Milling machines;

- Power saws;
- Jointers;
- Portable power tools; and
- Forming rolls and calendars.

17.4 BARRELS, CONTAINERS, AND DRUMS

Revolving drums, barrels, and containers will be guarded by an enclosure that is interlocked with the drive mechanism, so that the barrel, drum, or container cannot revolve unless the guard enclosure is in place.

17.5 EXPOSURE OF BLADES

When the periphery of the blades of a fan is less than seven (7) feet above the floor or working level, the blades will be guarded. The guard will have openings no larger than one-half (1/2) inch.

17.6 ANCHORING FIXED MACHINERY

Machines designed for a fixed location will be securely anchored to prevent walking or moving.

18. Equipment Operators

EMPLOYEES

- DO NOT operate heavy machinery that you have not been trained to use.
- ***If your license to operate a motor vehicle has been revoked for any reason, it is your responsibility to inform American Marines immediately.***

EMPLOYER

- Provide training for all employees who will be required to operate heavy machinery.
- Ensure that all required employee licenses are kept up to date.
- Do not permit employees to operate machinery that they have not been trained to operate.
- Maintain records of all employee training.

All employees who operate heavy machinery must be properly trained to do so. Only appropriately trained and licensed personnel will operate all trucks and forklifts. American Marine will keep records for employees who are licensed to operate industrial trucks (i.e., forklifts, cranes, other trucks) which include license number and expiration date. American Marine will not allow unlicensed employees or employees with expired or revoked licenses to operate these vehicles at any time.

19. Process Control Procedure for Handling Fuels, Oils, and Lubes

EMPLOYEES

- Know the potential locations of fuels, oils, and lubes onboard the vessel.
- Know the proper procedures for pumping fuels, oils, and lubes off of the vessel before performing such operations.
- Do not cause the release of any amount of fuels, oils, or lubricants onto the property or into the water.
- Report any spills to your supervisor immediately, including the location and types of spills.
- Place waste oils, fuels, and lubes in the proper disposal containers. DO NOT mix waste oils, fuels, or lubes with any other type of waste.
- Make all necessary preparations to control the accidental release of fuels, oils and lubes.

EMPLOYERS

- It will be the intent of American Marine to subcontract all handling of fuels, oils, and lubricants to a USCG approved company.
- Make all possible arrangements to contain potential spills before removal operations begin.
- Immediately inform local authorities in the event of a spill.
- Ensure that waste oils are properly disposed of in containers designated for that type of waste. Do not allow oils to be mixed with other types of waste.

19.1 REGULATORY AGENCIES

19.1.1 Environmental Protection Agency (EPA)

The EPA regulates the removal and disposal of waste oils under 40 CFR.
Spill Prevention and Management:

- Clean Water Act (CWA): 33 USC 1251 to 1376 (See 33 USC 1321, oil and hazardous substances)
- Oil Pollution Act of 1990 (OPA): 33 USC 2701 to 2761
- Discharge of oil regulations: 40 CFR 110
- Oil pollution prevention regulations: 40 CFR 112
- National Contingency Plan: 40 CFR 300
- United States Coast Guard (USCG) oil pollution regulations: 33 CFR 136 (oil spill liability trust fund), 33 CFR 151 to 156, 61 Federal Register (FR) 41452 to 41462 (8/8/96) (facilities transferring oil or hazardous materials in bulk)
- "One plan" contingency plan guidance: 61 FR 28642 (6/5/96)

19.1.3 Virginia Department of Environmental Quality (DEQ)

Title 62.1. - Waters of the State, Ports and Harbors
Chapter 11.1 - Department Of Environmental Quality

19.2 POSSIBLE LOCATIONS OF FUELS, OILS, AND LUBES

Items aboard a vessel which could potentially contain waste oils include but are not limited to:

- tanks

- pipes
- engines.

These items will be tested prior to removal in accordance with the sampling methodology outlined in the next section to determine the identity of the petroleum products and the potential content of hazardous substances such as PCBs, if any.

19.3 METHODS FOR DETERMINING THE PRESENCE OF FUELS, OILS, AND LUBES

19.3.1 Sample Methodology

Sampling for petroleum products will be done in the following manner:

Oils will be tested to determine PCB content. If the content exceeds 50 parts per million (ppm), then those oils will be handled in accordance with the PCB guidelines found in section A1. All other petroleum products will be sampled to determine their exact classification in order to determine the proper method of disposal.

19.3.2 Tests/Analysis to be Performed

Laboratory tests will be done on all samples collected to determine their exact nature.

19.3.3 Laboratories Performing Analysis

The following analytical lab has been identified as one that is qualified to analyze samples for the presence of and identities of petroleum products:

Universal Laboratories
20 Research Drive
Hampton, VA 23666
757-865-0880

19.4 Fuel, Oil, and Lube Removal/Disposal

19.4.1 Removal

The products mentioned above will be removed from the vessel in a manner specifically designed to minimize the risk of accidental release of the materials into the water and onto land. Protocols designed in conjunction with the American Marine's SPCC plan will be used.

19.4.2 Disposal

All waste petroleum products will be disposed of by delivering same in approved containers to a properly certified and pre-approved disposal company.

19.5 LABELING/MARKING

All containers that are used to transport waste petroleum products will be labeled to clearly show what the contents of each is.

19.6 SPILL PREVENTION AND EMERGENCY RESPONSE PLAN

19.6.1 General

40 CFR Part 112 provides for the preparation and implementation of Spill Prevention Control and Countermeasure Plans (SPCC) to minimize the potential for oil discharges. [112.1(e)]

19.6.2 Scope

The SPCC Plan as described below will be certified by a professional engineer, stating that he/she has inspected the facility and the SPCC Plan is in accordance with good engineering practices within six months of the start of operations at the shipyard. American Marine will maintain a complete copy of the SPCC Plan at the shipyard, and it will be located in such a way that it would be readily available to the Regional Administrator for on-site review during normal working hours. This facility has never accidentally discharged oil in harmful quantities into or upon the navigable waters of the United States or adjoining shorelines in two spill events, reportable under section 311(b)(5) of the FWPCA, occurring within any twelve-month period. Management gives its full approval and will commit the necessary resources to implement this plan. Any facilities, procedures, methods, or equipment not yet fully operational will be fully operational within six months of the start of operations at the shipyard. The plan includes the following sections:

- management approval;
- spill reporting procedures;
- pre-spill planning for major pollutant spill areas;
- description of spill containment design;
- description of spill clean-up equipment/facilities;
- spill training procedures;
- spill response procedures reflecting current facility design/layout and responding personnel; and
- description of inspection and recordkeeping procedures pertaining to spill equipment.

There is a reasonable potential for equipment failure (such as tank overflow, rupture, or leakage) in the following portions of the operations at the shipyard:

The predicted direction, rate of flow, and total quantity of oil which could be discharged from the facility as a result of each major type of failure is as follows:

Appropriate containment and/or diversionary structures or equipment to prevent discharged oil from reaching a navigable water course include the following controls:

Floating booms will surround each vessel to be dismantled upon arrival and prior to the start of any work on the vessel. In the event that a spill occurs, a trained crew will be on hand with the appropriate equipment to clean up the spilled oil. This equipment will include absorbent pads, skimmers, boats, and machinery to quickly and effectively clean up the spill.

19.6.3 Responsibilities

Personnel have been instructed in the operation and maintenance of equipment to prevent the discharges of oil and applicable pollution control laws, rules and regulations. The following person has been designated as being accountable for oil spill prevention and reports to line management.

Mr. Russ Francis
Mr. Steve McGee
American Marine Group LLC
425 Campostella Road
Norfolk, VA 23523

(757) 544-5635

Spill prevention briefings are scheduled and conducted for facility operating personnel at one month intervals to assure adequate understanding of the SPCC Plan for that facility. These briefings include topics such as known spill events or failures, malfunctioning components, and recently developed precautionary measures. A facility-specific response plan to EPA in accordance with 40 CFR Part 112, Appendix F has been developed and submitted.

Each aboveground storage area has a secondary containment area sufficiently large to contain the capacity of the largest aboveground oil storage tank within each storage area plus sufficient freeboard to allow for precipitation. The certification form contained in Appendix C of 40 CFR Part 112 has been completed and maintained at American Marine in order to demonstrate that the facility, because of its location, could not reasonably be expected to cause substantial harm to the environment by discharging oil into or on the navigable waters or adjoining shorelines of the United States.

19.6.4 Documentation

The response plan will follow the outline below:

Table of Contents
1.0 Model Facility-Specific Response Plan
- 1.1 Emergency Response Action Plan
- 1.2 Facility Information
- 1.3 Emergency Response Information
- 1.4 Hazard Evaluation
- 1.5 Discharge Scenarios
- 1.6 Discharge Detection Systems
- 1.7 Plan Implementation
- 1.8 Self-Inspection, Drills/Exercises, and Response Training
- 1.9 Diagrams
- 1.10 Security

2.0 Response Plan Cover Sheet
3.0 Acronyms
4.0 References

The facility response plan has been coordinated with the local emergency response plan developed by the local emergency planning committee under section 303 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (42 U.S.C. 11001 et seq.). American Marine reviews relevant portions of the National Oil and Hazardous Substances Pollution Contingency Plan and applicable Area Contingency Plan annually and, if necessary, revises the

facility response plan to ensure consistency with these plans. American Marine will review and update the facility response plan periodically to reflect changes at the facility. A facility response training program and a drill/exercise program has been developed and will be implemented to train those personnel involved in oil spill response activities.

19.6.5 Training and Documentation

Facility personnel have been properly instructed in the procedures to respond to discharges of oil and in applicable oil spill response laws, rules, and regulations. The training is functional in nature according to job tasks for both supervisory and non-supervisory operational personnel and includes specific lesson plans on subject areas relevant to facility personnel involved in oil spill response and cleanup.

20. Process Control Procedures for Chromated Water

EMPLOYEES

- Know the potential locations of chromated water onboard the vessel.
- Know the proper procedures for removing chromated water from the vessel before performing such operations.
- Prevent the release of chromated water to the environment whenever possible.
- Report any spills to your supervisor immediately.
- Place chromated water in the proper disposal containers. DO NOT mix chromated water with any other type of waste.

EMPLOYER

- Perform a survey to identify any chromated water located on board the vessel.
- Provide proper training in removing and disposing of chromated water to employees required to perform such work.
- Identify the proper authorities to contact in the event of a release of chromated water to the environment.

20.1 REGULATORY AGENCIES

20.1.1 Environmental Protection Agency (EPA)

The EPA regulates the removal and disposal of chromated water under Title 313 of 40 CFR.

20.1.2 Virginia Department of Environmental Quality (DEQ)

Title 62.1. - Waters of the State, Ports and Harbors
Chapter 11.1 - Department Of Environmental Quality

20.2 POSSIBLE LOCATIONS OF CHROMATED WATER

The principle location of chromated water on a vessel would be in the ballast tanks. Water from the tanks will be tested in accordance with the sampling methodology outlined in the next section to determine what amount of chromium, if any, is contained in these items before their removal.

20.3 METHODS FOR DETERMINING THE PRESENCE OF CHROMIUM

20.3.1 Sample Methodology

Samples will be taken from all ballast tanks to determine if the contents have been contaminated with chromium.

20.3.2 Tests/Analysis to be Performed

The following laboratory tests will be done on all samples collected:

EPA Method 200.8/6020, using ICP/MS analysis.

20.3.3 Laboratories Performing Analysis

The following analytical lab has been identified as one which is qualified to analyze samples for the presence of chromium:

Universal Laboratories
20 Research Drive
Hampton, VA 23666
757-865-0880

20.4 CHROMATE REMOVAL/DISPOSAL

20.4.1 Removal

Water which has been determined to contain chromium will be removed in a way which will minimize the risk of accidental release to both the surrounding land and waterway.

20.4.2 Disposal

Water containing chromium will be transported to a facility licensed to receive such wastes, with appropriate records of the transfer being retained by American Marine.

20.5 LABELING/MARKING

All containers whose contents are contaminated with chromium or self-contained items with chromium will be labeled as containing chromium.

21. Process Control Procedures for the Disposal of Mercury

EMPLOYEES

- Know the potential locations of mercury onboard the vessel.
- Know the proper procedures for removing mercury from the vessel before performing such operations.
- Place mercury in the proper disposal containers. DO NOT mix mercury with any other type of waste.
- Use proper personal protective equipment when removing mercury from the vessel.

EMPLOYER

- Train employees on the proper procedure for removing mercury from the vessel.
- Do not permit employees who have not been trained in the proper removal, storage, and disposal procedures to remove mercury from vessels.
- Provide employees with the proper personal protective equipment. Ensure that these employees have been properly trained in the equipment's use and that they wear the equipment properly at all times.
- Ensure that mercury waste is disposed of separately from all other wastes.

21.1 REGULATORY AGENCIES

21.1.1 Environmental Protection Agency (EPA)

The EPA regulates the removal and disposal of mercury under 40 CFR 260-279, Resource Conservation and Recovery Act.

21.1.2 Virginia Department of Environmental Quality (DEQ)

Title 62.1. - Waters of the State, Ports and Harbors
Chapter 11.1 - Department Of Environmental Quality

21.2 POSSIBLE LOCATIONS OF MERCURY

Items aboard a vessel that could potentially contain mercury include:

- gauges
- control panels

These items will be tested in accordance with the sampling methodology outlined in the next section to determine what amount of mercury, if any, is contained in these items before their removal.

21.3 METHODS FOR DETERMINING THE PRESENCE OF MERCURY

21.3.1 Sample Methodology

Sampling for mercury will be done on all items suspected of containing mercury.

21.3.2 Tests/Analysis to be Performed

The following laboratory tests will be done on all samples collected:

EPA Method 200.8/6020, using ICP/MS analysis.

21.3.3 Laboratories Performing Analysis

The following analytical lab has been identified as one that is qualified to analyze samples for the presence of mercury:

Universal Laboratories
20 Research Drive
Hampton, VA 23666
757-865-0880

21.4 MERCURY REMOVAL/DISPOSAL

21.4.1 Removal

Items that have been determined to contain mercury will be removed in a manner designed to minimize the risk and impact of an accidental release. Mercury will be placed in sealed and labeled containers for disposal. These containers will be stored, if necessary, in an area that is designated for the storage of hazardous materials. This area will be located in an area where the potential for accidental release is minimized. Any person handling mercury will ensure they use the appropriate impermeable gloves to prevent skin contact. Mercury will not be heated or otherwise aerosolized to present an inhalation hazard.

21.4.2 Disposal

All mercury-containing items to be disposed of will be transported and disposed in facilities that are approved by regulatory agencies to handle waste contaminated by mercury.

21.5 LABELING/MARKING

All containers whose contents are contaminated with mercury or self-contained items with mercury will be labeled.

22. Process Control Procedures for Ozone Depleting Substances

EMPLOYEES

- Know the potential locations of ozone depleting substances onboard the vessel.
- Know the proper procedures for removing ozone-depleting substances from the vessel before performing such operations.
- Report any spills to your supervisor immediately.
- Place ozone-depleting substances in the proper disposal containers. DO NOT mix ozone-depleting substances with any other type of waste.

EMPLOYER

- Train employees on the proper procedures for removing, storing, and disposing of ozone depleting substances.
- Ensure that ozone-depleting substances are disposed of properly, and that ozone-depleting substances are not mixed with any other type of waste.
- Ensure that employees know how to identify ozone-depleting substances.

22.1 REGULATORY AGENCIES

22.1.1 Environmental Protection Agency (EPA)

The EPA regulates the removal and disposal of ozone depleting substances under 40 CFR 82.150(b) and 82.152.

22.1.2 Virginia Department of Environmental Quality (DEQ)

Virginia has promulgated by reference the Clean Air Act, which includes 40 CFR 82.

22.2 POSSIBLE LOCATIONS OF OZONE DEPLETING SUBSTANCES

Ozone depleting substances include materials such as freon and halon. Items aboard a vessel that could potentially contain ozone-depleting substances include:

- compressors,
- air conditioning units,
- refrigeration devices, and
- fire suppression units.

These items will be tested in accordance with the sampling methodology outlined in the next section to determine what amount of ozone depleting substances, if any, is contained in these items before their removal.

22.3 METHODS FOR DETERMINING THE PRESENCE OF OZONE DEPLETING SUBSTANCES

22.3.1 Sample Methodology

All items listed above will be tested for the presence of Class I or Class II ozone depleting substances as defined in 40 CFR 82.

22.3.2 Tests/Analysis to be Performed

Laboratory tests will be done on all samples collected to identify whether or not the sample is an

ozone depleting substance, and to classify the type of ozone depleting substance.

22.3.3 Laboratories Performing Analysis

The following analytical lab has been identified as one that is qualified to analyze samples for the presence of ozone depleting substances:

Universal Laboratories
20 Research Drive
Hampton, VA 23666
757-865-0880

22.4 OZONE DEPLETING SUBSTANCES REMOVAL/DISPOSAL

22.4.1 Removal

22.4.1.1 Classifications

Class I Controlled Substances:

A. Group I:
$CFCl_3$-Trichlorofluoromethane (CFC-11)
CF_2Cl_2-Dichlorofifluoromethane (CFC-12)
$C_2F_3Cl_3$-Trichlorotrifluoroethane (CFC-113)
$C_2F_4Cl_2$-Dichlorotetrafluoroethane (CFC-114)
C_2F_5Cl-Monochloropentafluoroethane (CFC-115)
All isomers of the above chemicals

B. Group II:
CF_2ClBr-Bromochlorodifluoromethane (Halon-1211)
CF_3Br-Bromotrifluoromethane (Halon-1301)
$C_2F_4Br_2$-Dibromotetrafluoroethane (Halon-2402)
All isomers of the above chemicals

C Group III:
CF_3Cl-Chlorotrifluoromethane (CFC-13)
C_2FCl_5- (CFC-111)
$C_2F_2Cl_4$- (CFC-112)
C_3FCl_7- (CFC-211)
$C_3F_2Cl_6$- (CFC-212)
$C_3F_3Cl_5$- (CFC-213)
$C_3F_4Cl_4$- (CFC-214)
$C_3F_5Cl_3$- (CFC-215)
$C_3F_6Cl_2$- (CFC-216)
C_3F_7Cl- (CFC-217)
All isomers of the above chemicals

D Group IV: CCl4-Carbon Tetrachloride

E Group V:
$C_2H_3Cl_3$-1, 1,1 Trichloroethane (Methyl chloroform)
All isomers of the above chemical except 1,1,2-trichloroethane

F Group VI: CH_3Br--Bromomethane (Methyl Bromide)

G Group VII:
$CHFBr_2$
CHF_2Br (HBFC-2201)
CH_2FBr
C_2HFBr_4
$C_2HF_2Br_3$
$C_2HF_3Br_2$
C_2HF_4Br
$C_2H_2FBr_3$
$C_2H_2F_2Br_2$
$C_2H_2F_3Br$
$C_2H_2FBr_2$
$C_2H_3F_2Br$
C_2H_4FBr
C_3HFBr_6
$C_3HF_2Br_5$
$C_3HF_3Br_4$
$C_3HF_4Br_3$
$C_3HF_5Br_2$
C_3HF_6Br
$C_3H_2FBr_5$
$C_3H_2F_2Br_4$
$C_3H_2F_3Br_3$
$C_3H_2F_4Br_2$
$C_3H_2F_5Br$
$C_3H_3FBr_4$

$C_3H_3F_2Br_3$
$C_3H_3F_3Br_2$
$C_3H_3F_4Br$
$C_3H_4FBr_3$
$C_3H_4F_2Br_2$
$C_3H_4F_3Br$
$C_3H_5FBr_2$
$C_3H_5F_2Br$
C_3H_6FBr

Class II Controlled Substances

$CHFCl_2$-Dichlorofluoromethane (HCFC-21)
CHF_2Cl-Chlorodifluoromethane (HCFC-22)
CH_2FCl-Chlorofluoromethane (HCFC-31)
C_2HFCl_4- (HCFC-121)
$C_2HF_2Cl_3$- (HCFC-122)
$C_2HF_3Cl_2$- (HCFC-123)
C_2HF_4Cl- (HCFC-124)
$C_2H_2FCl_3$- (HCFC-131)
$C_2H_2F_2Cl_2$- (HCFC-132b)
$C_2H_2F_3Cl$- (HCFC-133a)
$C_2H_3FCl_2$- (HCFC-141b)
$C_2H_3F_2Cl$- (HCFC-142b)
C_3HCFCl_6- (HCFC-221)
$C_3HF_2Cl_5$- (HCFC-222)
$C_3HF_3Cl_4$- (HCFC-223)
$C_3HF_4Cl_3$- (HCFC-224)
$C_3HF_5Cl_2$- (HCFC-225ca)
C_3HF_5Cl- (HCFC-225cb)
C_3HF_6Cl- (HCFC-226)
$C_3H_2FCl_5$- (HCFC-231)
$C_3H_2F_2Cl_4$- (HCFC-232)
$C_3H_2F_3Cl_3$- (HCFC-233)
$C_3H_2F_4Cl_2$- (HCFC-234)
$C_3H_2F_5Cl$- (HCFC-235)
$C_3H_3FCl_4$- (HCFC-241)
$C_3H_3F_2Cl_3$- (HCFC-242)
$C_3H_3F_3Cl_2$- (HCFC-243)
$C_3H_3F_4Cl$- (HCFC-244)
$C_3H_4FCl_3$- (HCFC-251)
$C_3H_4F_2Cl_2$- (HCFC-252)
$C_3H_4F_3Cl$- (HCFC-253)
$C_3H_5FCl_2$- (HCFC-261)
$C_3H_5F_2Cl$- (HCFC-262)
C_3H_6FCl- (HCFC-271)
All isomers of the above chemicals

22.4.1.2 Removal Methods

Units containing ozone-depleting substances will be emptied by a licensed and certified disposal company. Records of the types and amounts of ozone depleting substances will be maintained by American Marine at the site for at least three years.

22.4.2 Disposal

American Marine prohibits the knowing venting or otherwise releasing into the environment any class I or class II substance used as a refrigerant. American Marine will not dispose of any device containing a class I or class I substance unless the refrigerant in the entire unit has been evacuated to a certified recovery or recycling machine.

22.5 LABELING/MARKING

All containers whose contents are contaminated with ozone depleting substances or self-contained items with ozone depleting substances will be labeled.

23. Process Control Procedure for the Disposal of Non-Point Source Wastewater

23.1 SOURCES

Sources for stormwater pollution include runoff, equipment oil leaks, loose soil, and dust. For additional potential pollution sources and best management practices, refer to the DMG Stormwater Pollution Prevention Plan.

23.2 NPDES Permit

The facility at 425 Campostella Road has applied for and received VPDES Permit No. VAR051681, VPDES Storm Water General Permit Coverage, that addresses all point source wastewater discharges which was submitted by the actual operator of the facility.

The application includes the following information:

- A description of waste water producing activities;
- Name, mailing address, and location of the facility for which the application is submitted;
- Up to four SIC codes which best reflect the facility's products/services;
- Operator's name, address, telephone number, ownership status, and status as Federal, State, private, public or other entity;
- Whether the facility is located on Indian lands;
- Complete facility permit listing, including any construction approvals received or applied for under the Hazardous Waste Management program under RCRA; the UIC program under SDWA, the NPDES program under CWA, the PSD program of the CAA; the Nonattainment program under the CAA; the NESHAPS preconstruction approval under the CAA; ocean dumping permits under the Marine Protection Research and Sanctuaries Act; dredge or fill permits under section 404 of the CWA; and, other relevant environmental permits, including State permits.
- A topographic map (or other map if a topographic map is unavailable) extending one mile beyond the property boundaries of the source, depicting the facility and each of its intake and discharge structures; each of its hazardous waste treatment, storage, or disposal facilities; each well where fluids from the facility are injected underground; and those wells, springs, other surface water bodies, and drinking water wells listed in public records or otherwise known to the applicant in the map area; and
- A brief description of the nature of the business.
- Longitude and latitude of outfall(s) to the nearest 15 seconds and the name of the receiving water;
- The date of expected commencement of discharge (for new dischargers);
- An identification of the general type of waste discharged, or expected to be discharged upon commencement of operations, including sanitary wastes, restaurant or cafeteria wastes, or non-contact cooling water;
- An identification of cooling water additives (if any) that are used or expected to be used upon commencement of operations, along with their composition if existing composition is available;
- Effluent characterization (BOD, TSS, Fecal Coliform (if believed present or if sanitary waste is or will be discharged), Total Residual Chlorine (if chlorine is used), Oil and Grease, COD (if non-contact cooling water is or will be discharged), TOC (if non-contact cooling water is or will be discharged), NH3 as N, Discharge Flow, pH, and Temperature (Winter and Summer));

- A description of the frequency of flow and duration of any seasonal or intermittent discharge (except for stormwater runoff, leaks, or spills);
- A brief description of any system used or to be used;
- Any additional information the applicant wishes to be considered, such as influent data for the purpose of obtaining "net" credits pursuant to 122.45(g); and
- A signature of certifying official under 122.22.

Estimates for the pollutants or parameters listed instead of actual sampling data will be included, along with the source of each estimate. All levels must be reported or estimated as concentration and as total mass, except for flow, pH, and temperature. In addition, the new discharger must complete and submit Item IV of Form 2e (see 122.21(h) (4)) by providing quantitative data in accordance with that section no later than two years after commencement of discharge. However, the applicant need not complete those portions of Item IV requiring tests that he has already performed and reported under the discharge monitoring requirements of his NPDES permit.

For a facility which is a "new source" and which is located in a State without an approved NPDES program, did the facility submit the application for an NPDES permit prior to beginning any on-site construction as defined in 122.29. [122.21(l)]

23.3 PERMIT CONDITIONS

The facility will comply with all effluent standards, prohibitions and conditions of the permit. The facility will apply for a new permit at least 180 days prior to expiration date of the current permit. American Marine will take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of the permit that has a reasonable likelihood of adversely affecting human health or the environment. The facility will properly operate and maintain at all times, all facilities and systems of treatment and control that are installed or used by the facility to achieve compliance with the permit.

The facility will provide requested information and access to facility for inspections, including sample collection, by authorized representatives of the permitting agency. All samples and measurements taken for the purposes of monitoring information are representative of the permitted discharge.

23.4 RECORDKEEPING

All calibrations, maintenance records and all original strip chart recordings from continuous monitoring instrumentation will be retained on-site for at least three years. Copies of all reports required by the permit will be retained on-site for at least three years. All records of data used to complete the permit application will be retained on-site for at least three years.

Monitoring records will include the following:

- date,
- exact place and time of sampling or measurement.
- individual(s) who performed the sampling or measurements,
- date(s) analyses were performed,
- analytical techniques or methods used, and
- analytical results,

All monitoring will be conducted according to test procedures approved under 40 CFR 136. All monitoring reports and other information submitted to the permitting agency will be signed and

certified. All data used to complete permit applications and any supplemental information submitted in conjunction with a permit application will be retained for at least three years from the date the application is signed.

24. Waste Management

EMPLOYEES

- DO NOT mix different types of waste under any circumstances. Place a particular waste in the container specifically designated that type of waste ONLY.

EMPLOYER

- Ensure that waste is properly separated and placed in the proper containers.
- Ensure that waste is properly manifested, and that waste disposal records are properly maintained.
- Ensure that waste is properly disposed of.

24.1 SEGREGATION OF WASTES

Before disposing of wastes, the wastes must be separated for proper handling and characterization. Separate disposal facilities will be provided for each of the following:

- PCBs
- Asbestos
- Fuels, Oils, and Lubes
- Chromated Water
- Mercury
- Ozone Depleting Substances
- Lead
- Electrical Cable
- Ductwork
- Ductwork Flanges containing PCB gaskets

Methods for disposing each type of waste have been outlined in the sections that address each of the wastes separately.